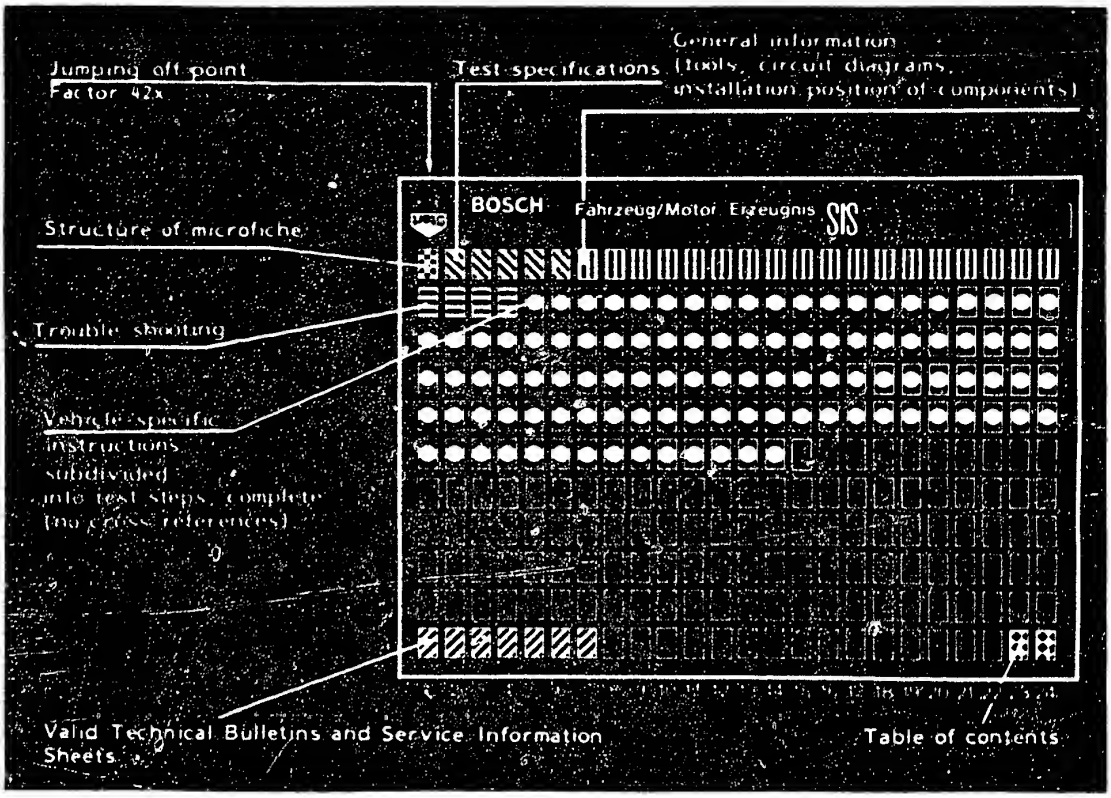
Structure of microfiche



1. Read from left to right

2. Title of microfiche (appears on each coordinate)

E 16	Product/assembly/test step Vehicle/engine	

Coordinate

3. Limits of section

Beginning | Mid-section | End | One-page section

4. Purely vehicle-related passages identified by a vertical bar.

5. References to relevant test steps in test specifications; coordinate e.g. C6

C6

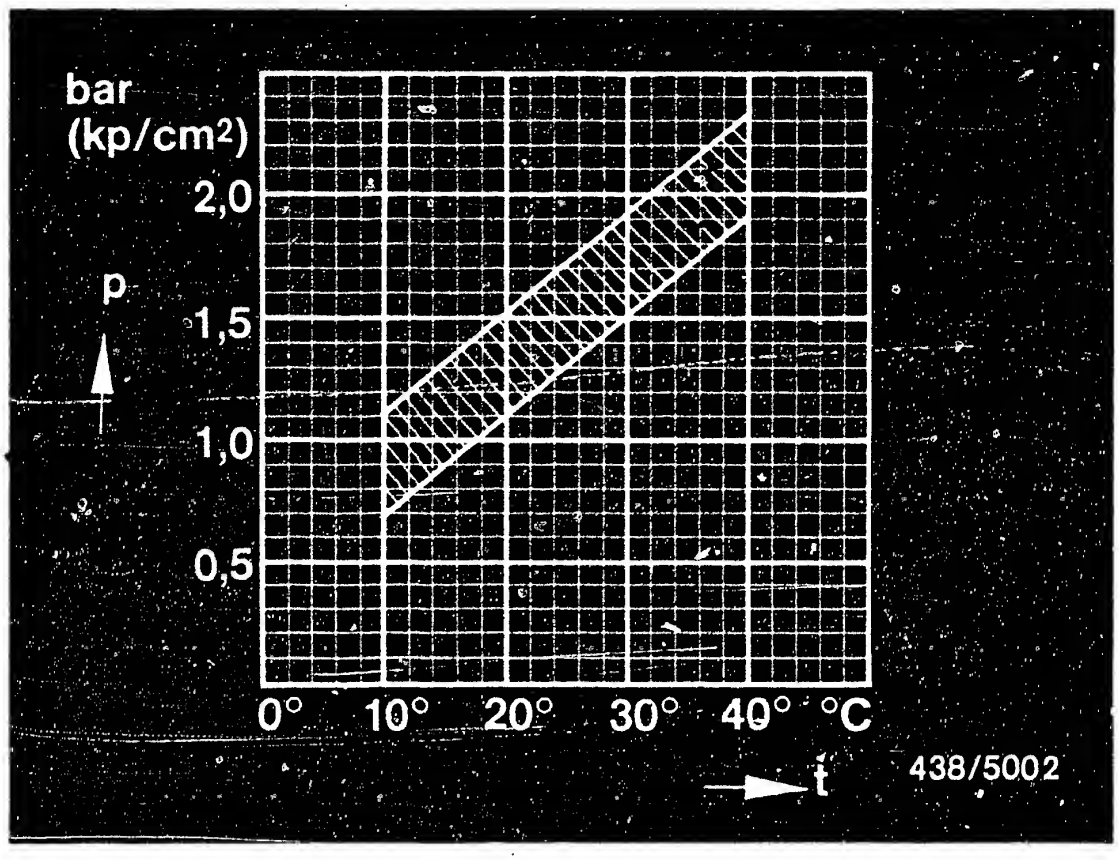
A1	Trouble-shooting program	

1. Test specifications

1.1 Electric fuel pump

C3

Test step	Test specifications
Fuel delivery:	min. 950 cm^3/30 s



p = Control pressure (gauge pressure)
t = Ambient temperature

C11

1.2 Control pressure "Cold"

For testing, connect vacuum pump to intake-manifold-pressure connection of warm-up regulator.

Setting value: 510...550 mbar
(385...415 mmHg)

Part no. of warm-up regulator: 0 438 140 038

(Version for intake-manifold-pressure-controlled full-load enrichment)

Test step	Test specifications*

1.3 Control pressure "Warm"

C11

Part no. of warm-up regulator: 0 438 140 038
(Version for intake-manifold-pressure-controlled full-load enrichment)

- Test at atmospheric pressure
  (Without vacuum): 3.0...3.4 bar (3.1...3.5 kgf/cm^2)

- For testing, connect vacuum pump to intake-manifold-pressure connection of warm-up regulator.

  Setting values:
  510...550 mbar
  (385...415 mmHg): 3.4...3.8 bar (3.5...3.9 kgf/cm^2)

- Leak test on full-load diaphragm
  Maximum pressure drop from setting value: 100 mbar (75 mmHg)/15s

*Pressures in the test-specification table are given in bar (gauge pressure) and/or in kgf/cm^2 (gauge pressure).

Test step		Test specifications*
1.4 Primary pressure		**D4**
Fuel distributor		
0 438 100 081 (79/80 model)	Checking value	4.5...5.2 bar (4.6...5.3 kgf/cm²)
	Setting value	4.7...4.9 bar (4.8...5.0 kgf/cm²)
Fuel distributor		
0 438 100 092 (As of 81 model)	Checking value	4.7...5.4 bar (4.8...5.5 kgf/cm²)
	Setting value	4.9...5.1 bar (5.0...5.2 kgf/cm²)

1.5 Leak test: **D12**

	Fuel accumulator	
	0 438 170 014 (79/80 model)	0 438 170 029 (As of 81 model)
Minimum pressure after 10 minutes:	1.6 bar (1.7 kgf/cm²)	2.7 bar (2.8 kgf/cm²)
after 20 minutes:	1.4 bar (1.5 kgf/cm²)	2.6 bar (2.7 kgf/cm²)

1.6 Injection valves: **E6**

Part number 0 437 502 013 (79/80 model)
Opening pressure: 2.7...3.8 bar (2.8...3.9 kgf/cm²)

Part number 0 437 502 010 (As of 81 model)
3.0...4.1 bar (3.1...4.2 kgf/cm²)

* Pressures in the test-specification table are given in bar (gauge pressure) and/or in kgf/cm² (gauge pressure).

E15

1.7 Fuel distributor

Comparative measurement of fuel deliveries.

- Fuel distributor part number: 0 438 100 081

	Setting point	Max. allowable delivery
Idle	6.0 cm^3/min.	6.8 cm^3/min.
Part load	40.0 cm^3/min.	43.0 cm^3/min.
Full load	145.0 cm^3/min.	160.0 cm^3/min.

- Fuel distributor part number: 0 438 100 092

	Setting point	Max. allowable delivery
Idle	6.0 cm^3/min.	6.6 cm^3/min.
Part load	40.0 cm^3/min.	43.0 cm^3/min.
Full load	155.0 cm^3/min.	170.0 cm^3/min.

F5

1.8 Idle adjustment*

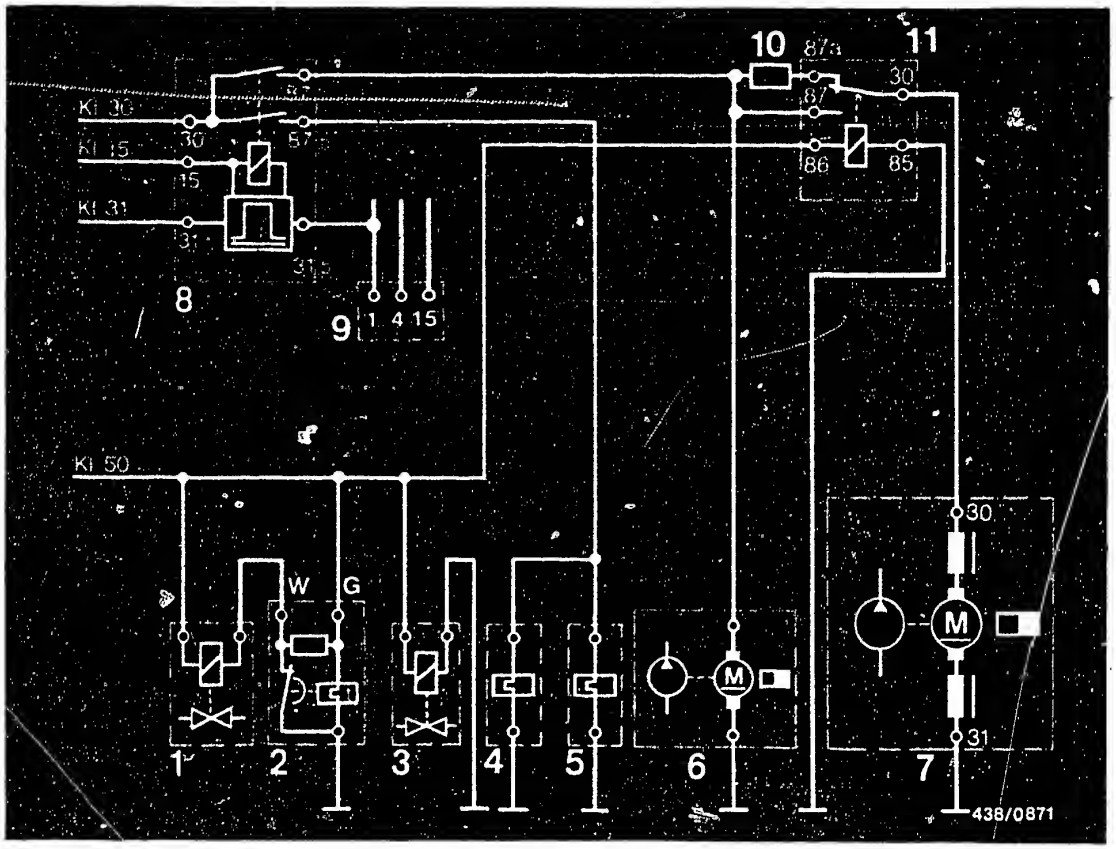
- Idle speed

  Manually-shifted transmission: 850...950 min^{-1}
  Automatic transmission: 925...1025 min^{-1}

- CO concentration for each cylinder bank

  Manually-shifted transmission: 1.5...2.5 & by vol. CO
  Automatic transmission 1.0...1.5 % by vol. CO

*Engine at normal operating temperature
Air conditioner switched off



1 = Start valve
2 = Thermo-time switch
3 = Pressure-reduction valve (in 1979/80 model)
4 = Warm-up regulator
5 = Auxiliary-air device
6 = Pre-supply pump
7 = Electric fuel pump
8 = Electronic relay
9 = Ignition coil
10 = Series resistor
11 = Pump starting relay

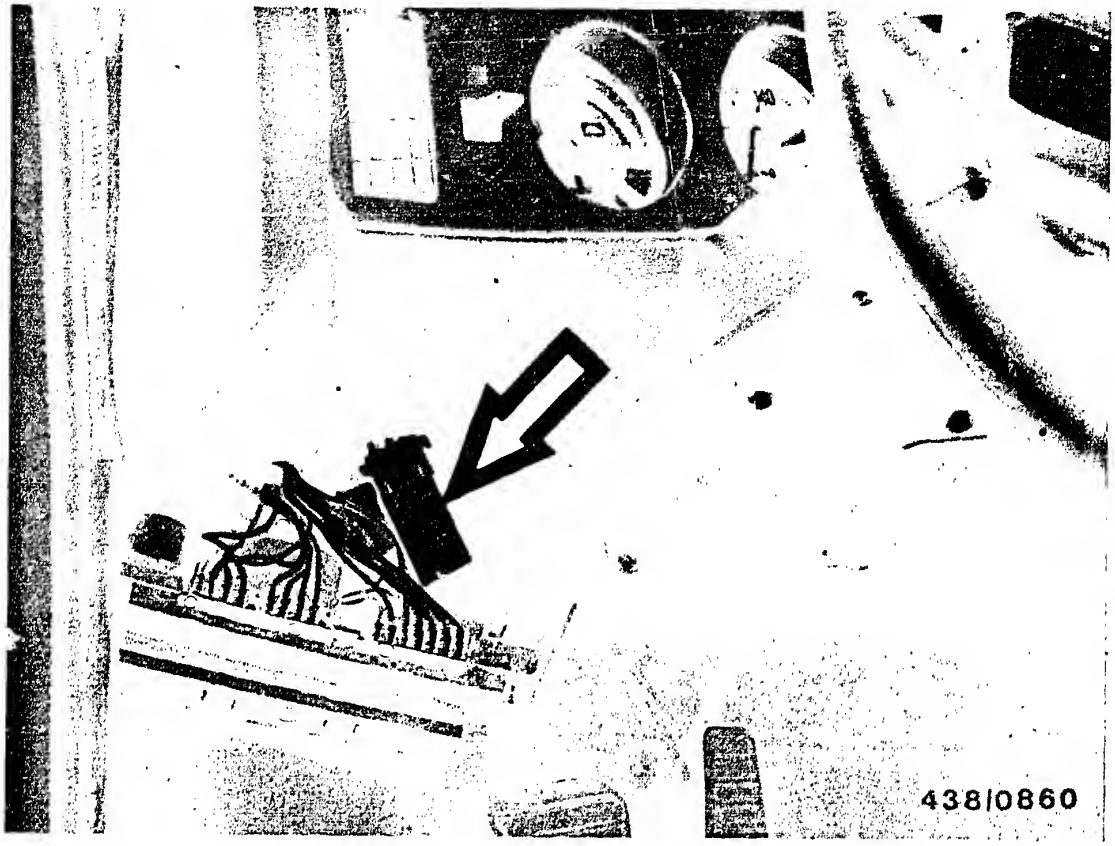
2. Electrical safety circuit

2.1 Circuit diagram

The safety circuit employs an electronic relay which is triggered from terminal 1 of the ignition coil.

- The pressure-reduction valve opens while the engine is being cranked. This reduces the control pressure to approx. 0.7 bar gauge pressure.

- The series resistor of the electric fuel pump is bridged during cranking by the pump starting relay.



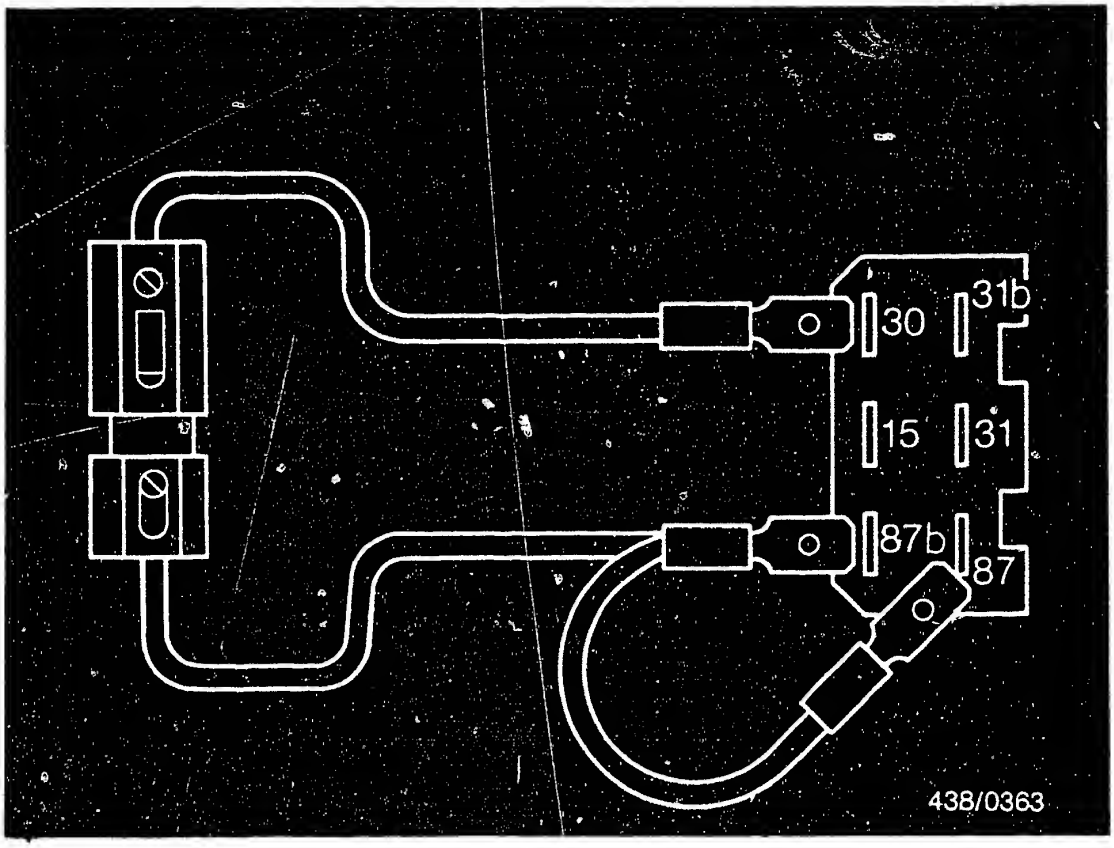
2.2 Bridging the safety circuit

In order to carry out testing with the engine stationary, it is necessary to bridge the safety circuit.

The relay (arrow) is mounted on a plug-in base to the left of the steering column under the instrument panel.

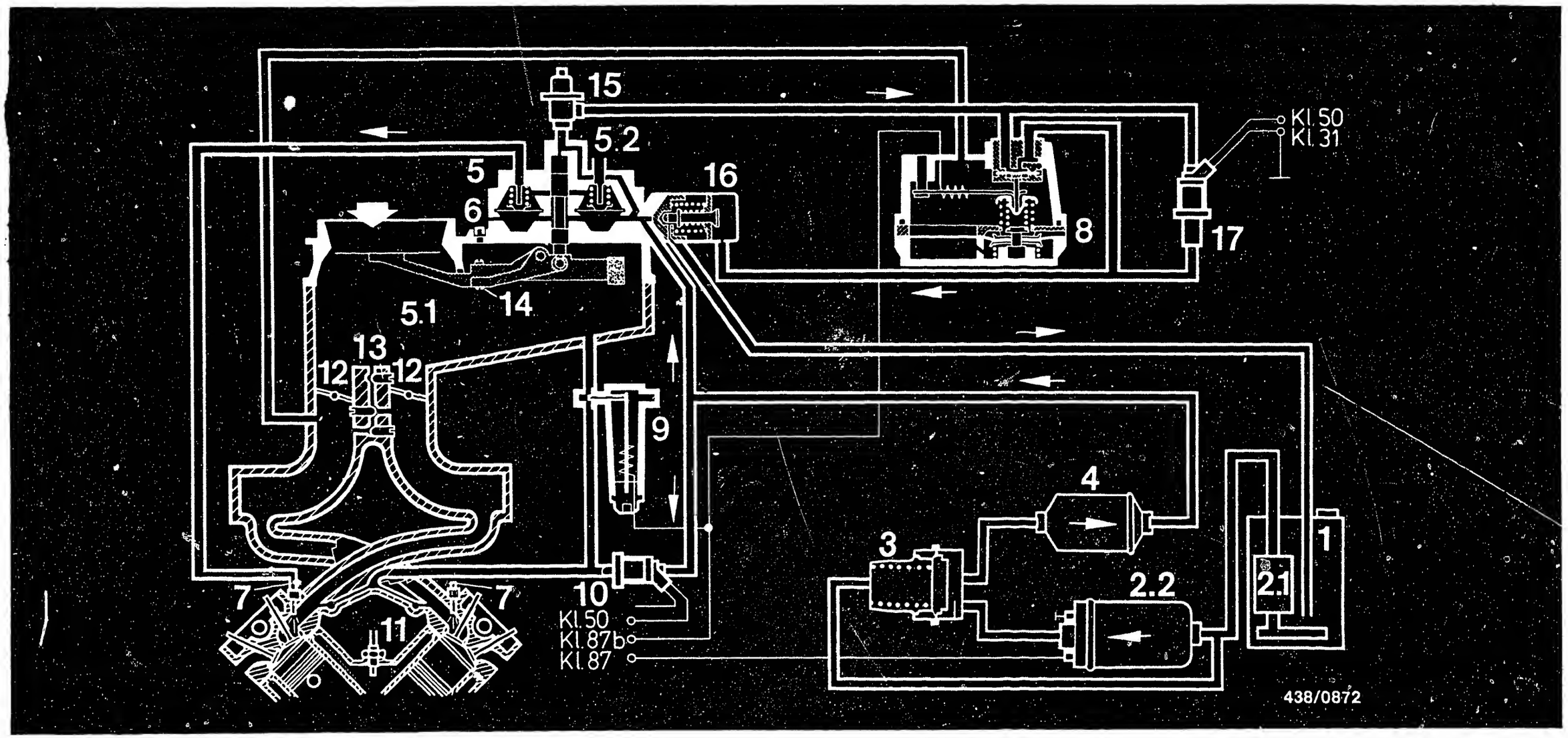
After loosening the screws it is possible to hinge the relay board downward.

The electronic relay is now accessible; it hangs from the plug-in base on the right-hand side.



Connect contacts 87 and 87b with contact 30 in the base with a twin bridge.
Use connecting cable 1.5 mm² with fuse holder and 16 A fuse.

Electric fuel pump, pre-supply pump, warm-up regulator and auxiliary-air device are now supplied with battery voltage.



3. Diagram of fuel lines

1 = Fuel tank
2.1 = Pre-supply pump
2.2 = Electric fuel pump
3 = Fuel accumulator
4 = Fuel filter
5 = Mixture-control unit
5.1 = Air-flow sensor
5.2 = Fuel distributor
6 = Anti-tamper cap
7 = Injection valve
8 = Warm-up regulator
9 = Auxiliary-air device
10 = Start valve
11 = Thermo-time switch
12 = Throttle valve
13 = Idle-speed screw (bypass)
14 = Idle-mixture-adjusting screw
15 = Fuel-line-pressure damper (as of 1981 model)
16 = Primary-pressure regulator with push valve
17 = Pressure-reduction valve (in 1979/80 model)

4. General Information

4.1 Introduction

The vehicles Renault R30 TX are supplied with 6-cylinder engine with K-Jetronic in the following designs:

European models	as from 1979 model
Swedish models	as from 1980 model

This repair manual refers only to the above-mentioned vehicles and gives a concise description of the testing and adjustment operations to be performed on the vehicle on the K-Jetronic.

All the system components are dealt with in separate working steps with the corresponding test specifications. In addition to this repair manual the appropriate testing and repair manuals will, of course, be issued for every other vehicle type equipped with the K-Jetronic.

The K-Jetronic differs from other known fuel-injection systems in terms of both construction and operation. In order to be able to carry out the testing procedures described in this manual - and therefore to be able to assess the components - the K-Jetronic and its operation should be clearly understood. The essential points of the operation and construction of the K-Jetronic are described in Technical Instruction VDT-U 3/1 En.

When trouble-shooting the K-Jetronic, it is assumed that the ignition is in order and that the engine is in proper mechanical condition.

The individual test steps of this repair manual are detailed and self-contained. This permits direct trouble-shooting without having to go through the entire test program for each fault.

The trouble-shooting chart on Coordinates B 1 - B 4 is intended to make it easier to decide which test steps have to be carried out for certain faults.

According to the symptom stated by the customer or which you yourself have determined, select the possible cause in the trouble-shooting chart. The coordinate at the end of the cause column refers to the appropriate test step with the associated test specification.

Important note:

If any fuel connections are loosened, parts removed, also on the vacuum system, always use new seals when re-connecting or re-installing.

Ensure utmost cleanliness when working on the K-Jetronic. Fuel connections must be cleaned thoroughly on the outside before opening.

4.2 Design

The entire system of the K-Jetronic in these vehicle types corresponds, with the exception of the differences listed below, to the basic design as described in Technical Instruction VDT-U 3/1 En.

4.3 The following components are different or extra:

- Electric fuel pump with replaceable non-return valve.
- Fuel accumulator with doubled storage volume (40 cm^3).

  On accumulator 0 438 170 029 the spring chamber is connected by means of a hose piece to the intake line of the electric fuel pump.

- 6-cylinder mixture control unit with downdraft air-flow sensor.
- Fuel distributor with adjustable differential-pressure valves. In this type of fuel distributor, screw plugs are situated adjacent to the fittings for the fuel-injection lines.
  This possibility for adjustment has only been introduced for production at the works. This does not result in any additional adjustment possibilities for the After-Sales Service Organization. For this reason, the fuel distributor is to be dealt with in precisely the same manner as the conventional model.
  The screw plugs must not be removed or loosened.

- Pre-supply pump in fuel tank.
  When testing the electric fuel pump (testing its delivery) the possible influence of the pre-supply pump should be borne in mind.

- Warm-up regulator 0 438 140 038 for intake-manifold-pressure-controlled full-load enrichment.
  Intake manifold pressure connection on top part of housing.

- Electrical safety circuit.
  The pre-supply pump, electric fuel pump, warm-up regulator and auxiliary-air device are energized via an electronic relay. This ensures that when the engine is stopped with the ignition on the electric fuel pump cannot start and the warm-up regulator and auxiliary-air device cannot shut off prematurely.

- Series resistor and pump starting relay in the power supply line to the electric fuel pump. During cranking the series resistor is bridged by the pump starting relay.

In the 1979 and 1980 models

- Pressure-reduction valve in parallel with the warm-up regulator.
  The pressure-reduction valve opens while the engine is being cranked. The control pressure is reduced to approx. 0.7 bar gauge pressure.

- Injection valves with female thread M8x1, flexible fuel-injection tubing.

As of 1981 model

- Mixture-control unit 0 438 060 036 with
- Fuel distributor 0 438 100 092 with integral pressure-relief valve (on control-pressure dome). At below 0.3 bar gauge pressure in the fuel system this valve opens the return as a result of which the gauge pressure drops to 0 bar. This prevents the control plunger in the fuel distributor from possibly being sucked up as the engine cools down. In addition, a compression spring is installed above the control plunger.

- Injection valves with male thread M12x1.5, rigid fuel-injection tubing.

- Fuel-line-pressure damper in the control-pressure line for preventing pressure peaks during acceleration.

- Air-flow sensor 0 438 120 133 with stroke sensor for fuel consumption indicator screwed onto the side. In accordance with the stroke of the air-flow sensor plate (instantaneous fuel consumption) the stroke sensor delivers a rectangular-wave voltage signal of defined frequency to the indicator (non-Bosch product) in the instrument panel. The frequency is between approx. 24 kHz at idle and approx. 17 kHz at full load.
  The display may be in liters/hour or, in conjunction with a displacement pickup, in liters/100 km.

4.4 Equipment in the Sweden model

- Expansion reservoir (accumulator without compression spring) for larger accumulator volume for the cooling-down phase.

5. Test equipment and tools

- Pressure tester KDJE-P 100 (previously KDEP 1034).
  For testing all fuel pressures and testing for leaks.

- Connecting-parts set KDJE-P 100/10 (previously KDEP 1034/10).
  For connecting pressure tester to the control-pressure port of the fuel distributor.

- Adjusting wrench KDEP 1035.
  For adjusting the idle-mixture-adjusting screw in the mixture-control unit (CO-adjustment).

- Guide ring KDEP 1040/10 (dia. 85 mm)
  For centering the air-flow sensor plate in the air-flow sensor.

- Tester for delivered quantity comparison KDJE-P 200 (previously KDJE 7451).
  For comparing the fuel delivered from the individual fuel-distributor outlets.

- Graduate (commercially available, capacity approx. 1.5 l)
  For measuring the delivery of the electric fuel pump.

- Electric connecting cable (test lead).
  KDJE 7450/70 for the direct connection of components to be tested, e.g. cold-start valve.

- Valve tester KDJE-P 400 (previously KDJE 7452).
  For testing the injection valves.

  Test media: Calibrating fluid (Shell K 30, Esso-Varsol, Shell Mineral Spirits 135) or
  Bosch, Part Designation VS 14942-CH
  Previously Part No. 5 973 340 650
  The Bosch calibrating fluid can be obtained in 5 l metal cans from the following supplier:
  Firma
  Oskar Gnamm GmbH & Co
  D-7531 Kämpfelbach-Bilfingen

Caution:
For safety reasons, never use normal gasoline or similar easily inflammable and combustible liquids.
Even with calibrating fluid, be sure to observe the local official regulations.

- Tachometer (commercially available)
  For idle-speed adjustment.
- CO meter (commercially available)
  For idle-speed CO adjustment.
- Vacuum pump (commercially available)
  For testing the warm-up regulators with full-load enrichment dependent on intake-manifold pressure, e.g. the vacuum hand-operated pump from

  Firma Korinth
  Ludwig-Kloos-Strasse 21
  6450 Hanau 7 (Steinheim)

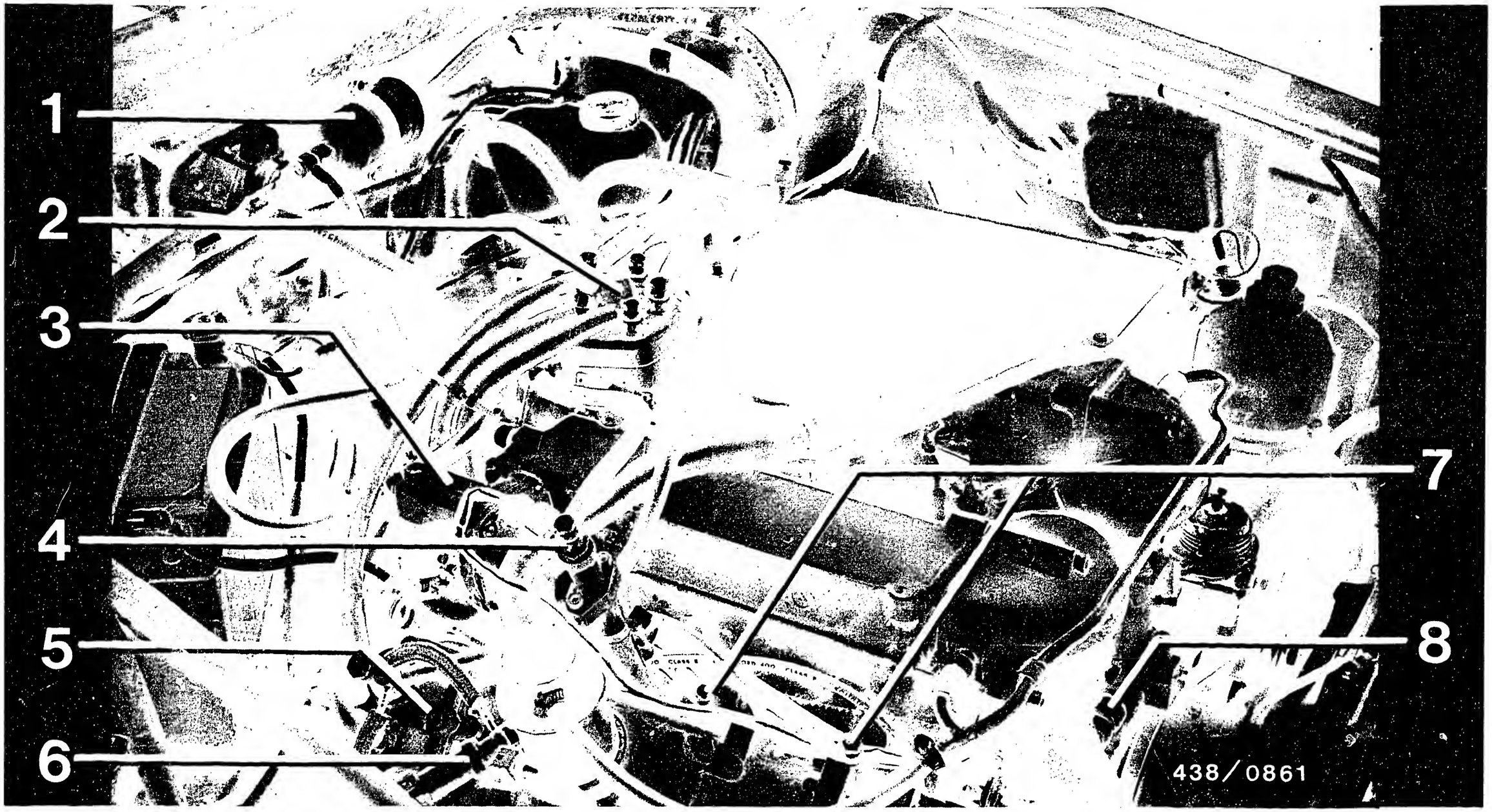
- Tool set for fitting and removing the idle CO anti-tamper device on the air-flow sensor. (e.g. No. 131090 from Cartool, Hans Schubert KG, Unterer Grasweg 88/D-8070 Ingolstadt).

- Setting device KDJE 7456

For deflecting the air-flow sensor plate (downdraft air-flow sensor) when comparing the deliveries from the outlets of the fuel distributor.

- Line set KDJE-P 200/25 (previously KDJE 7451/25)

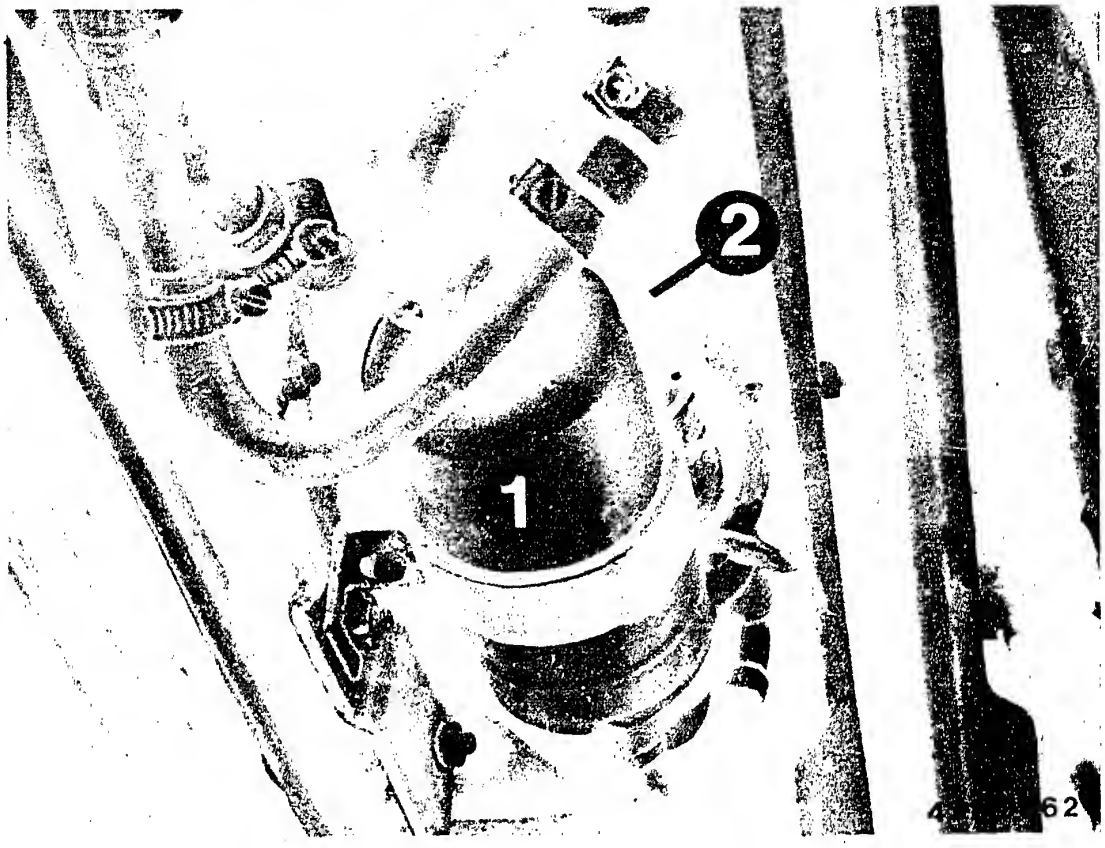
For connecting the tester for delivered quantity comparison to the K-Jetronic system with steel fuel-injection tubing. As of 1981 model.



6. Installation position of individual components

6.1 Arrangement of components on engine

1 = Fuel filter
2 = Mixture-control unit
3 = Auxiliary-air device
4 = Start valve
5 = Warm-up regulator
6 = Pressure-reduction valve
7 = Injection valves
8 = Thermo-time switch



1 = Electric fuel pump
2 = Fuel accumulator

6.2 Fuel-supply components

The electric fuel pump and the fuel accumulator are mounted on a common support piece in front of the rear axle, on the right-hand side as viewed from behind the vehicle.
The connections of these components should be thoroughly cleaned before replacing.
Before loosening the connections, pinch off the intake hose of the electric fuel pump so that no fuel can escape (e.g. using hose clamper W 157 from Matra Co.).

7. Trouble-shooting chart (see also Coordinates (B 3/B 4)

Customer complaint (fault symptom)

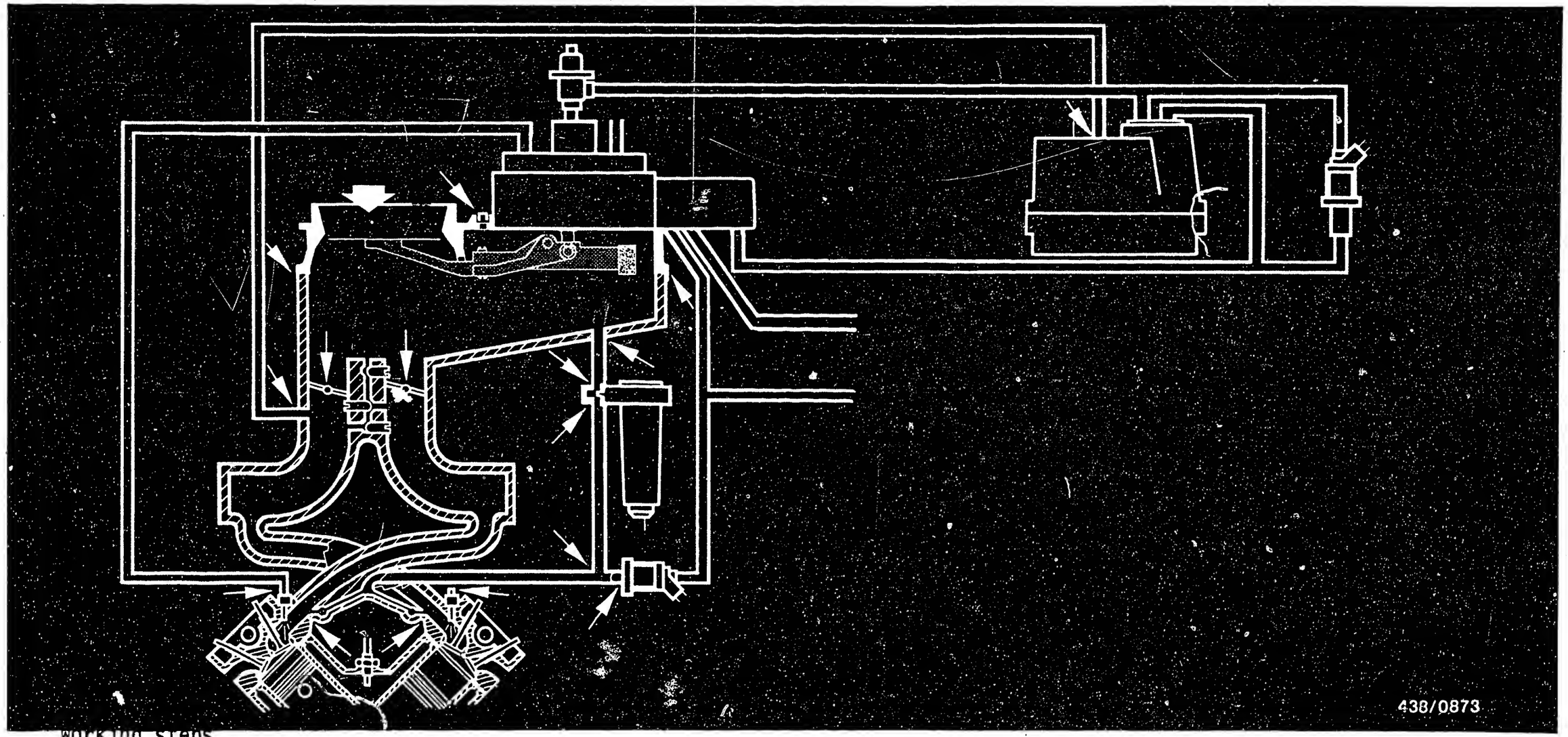
1. Engine does not start, or starts poorly, in cold condition
2. Engine does not start, or starts poorly, in warm condition*
3. Irregular idling during the warm-up phase (shakes)
4. Irregular idling with warm engine (shakes)
5. Engine does not draw gas, burbles
6. Engine misfires when operating on the road, high load
7. Insufficient power

1	2	3	4	5	6	7	Cause	Coordinates
	●	●	●	●		●	Vacuum system leaking	B 5
●	●		●	●	●	●	Air-flow sensor lever and/or control plunger not moving smoothly	B 7
	●						Position of the air-flow sensor plate incorrect	B 17
●		●					Auxiliary-air device does not open	C 1
●	●				●		Electric fuel pump not operating	C 3
●							Cold-start system defective	C 7
		●	●				Cold-start valve leaking	C 9
				●			Excessive fuel delivery for control-pressure circuit	C 13
●		●					"Cold" control pressure outside tolerance	C 11
	●		●	●	●	●	"Warm" control pressure too high (after warm-up)	C 11
			●	●		●	"Warm" control pressure too low (after warm-up)	C 11
					●	●	Primary (system) pressure outside tolerance	D 4
	●						Overall fuel system leaking	D 12
●	●	●	●		●		Injection valves leaking, opening pressure too low	E 6
●	●	●	●			●	Unequal fuel delivery (imbalance of fuel delivery)	E 15
●	●	●	●	●			Basic idle adjustment incorrect	F 5
						●	Throttle plate does not open completely	---

*Note:
If, in the case of Symptom 2, after checking and repairing all the fault causes listed below, the hot-start characteristic is still unsatisfactory this can be improved by fitting an impulse relay.
The fitting of this relay is described in Coordinates L 5.
Only as of 1981 model
(without pressure reduction valve)

Customer complaint (fault symptom) (continued)

8. Engine runs on after being switched off ("diesels")	9. Fuel consumption too high	10. Flat spot during acceleration	11. CO concentration during idling too high	12. CO concentration during idling too low	13. Idle-speed cannot be adjusted (too high)	14. Engine starts but then immediately stops	Cause	Coordinates
		●		●			Vacuum system leaking	B 5
●		●	●	●			Air-flow sensor and/or control plunger not moving smoothly	B 7
●							Position of the air-flow sensor plate incorrect	B 17
							Auxiliary-air device does not open	C 1
					●		Auxiliary-air device does not close	C 3
						●	Electric fuel pump not operating	C 7
							Cold-start system defective	C 9
●	●		●				Cold-start valve leaking	C 13
		●				●	Excessive fuel delivery for control-pressure circuit	C 11
		●				●	"Warm" control pressure too high (after warm-up)	C 11
	●	●	●			●	"Warm" control pressure too low (after warm-up)	C 11
		●				●	Primary (system) pressure outside tolerance	D 4
							Overall fuel system leaking	D 19
●							Injection valves leaking, opening pressure too low	E 6
		●					Unequal fuel delivery (imbalance of fuel delivery)	E 15
●	●	●	●	●			Basic idle adjustment incorrect	F 5
							Throttle plate does not open completely	---



Working steps

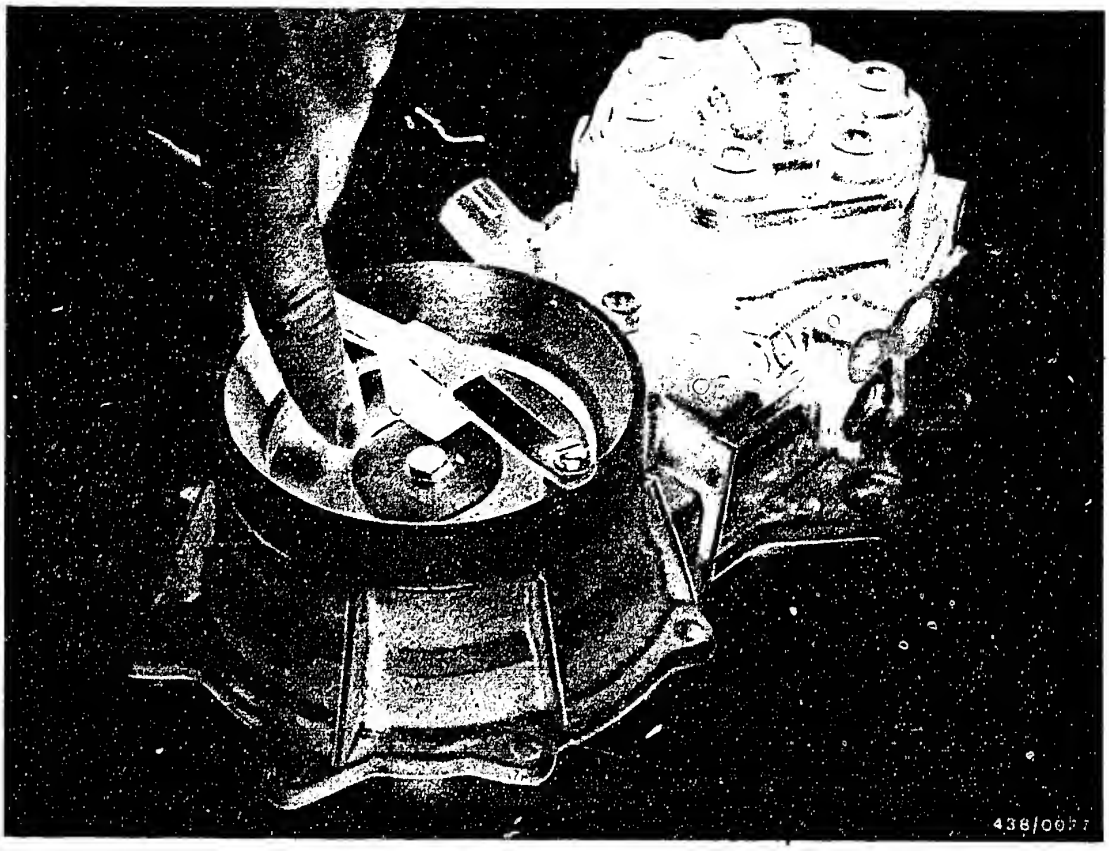
8. Check the vacuum system of the engine for leaks.

The arrows in the diagram show typical points where leaks can occur.
Check by performing a visual inspection or, in cases of doubt as follows: Disconnect the hose from the outlet of the auxiliary-air device and blow air through this hose into the intake system using a compressed-air gun. The throttle valve is to be fully open. Brush connection points with soapy water, or spray with leak detector (e.g. Güpoflex).
Under no circumstances may combustible liquids be used when testing for leaks.
The formation of bubbles or foam indicates a leak.
If a leak has been eliminated, it is necessary finally to adjust the idle speed with the engine at normal operating temperature: Idle-speed adjustment is described on Coordinates F 5.

9. Check the control lever in the air-flow sensor and the control plunger in the fuel distributor for ease of movement.

9.1 Preparations

- Engine temperature not below +20°C.
- Remove the rubber hood so that the air-flow sensor plate becomes accessible.
- Switch on the electric fuel pump for approx. 10 seconds by bridging the safety circuit.
  This results in application of the control pressure to the control plunger in the fuel distributor.

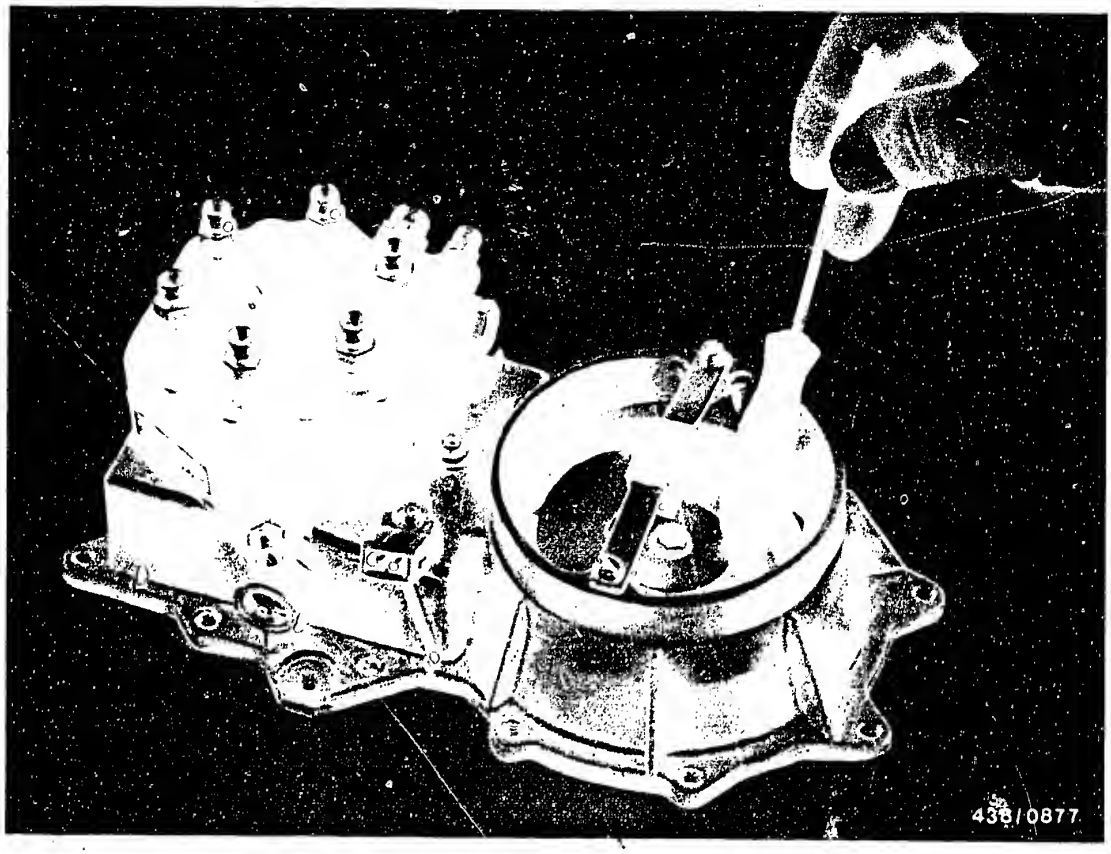


9.2 Check that the control lever moves freely

Press down the air-flow sensor plate by hand (down-draft) and release again. The sensor plate snaps back into the zero position and bounces up about twice from the spring-loaded stop. If the control lever does not move freely, first release all fastening screws holding the air-flow sensor to determine whether housing deformation is the cause of the problem. If the problem is solved by loosening the fastening screws, the seal between the air-supply housing and air-flow sensor should be changed (Renault-service part).

Tighten the screws uniformly cross-wise to a torque of 9...10 Nm (0.9...1.0 kgf/m).

If the housing is not deformed, then the air-flow sensor must be repaired or replaced.



9.3 Check that the control plunger moves freely

Depress the air-flow sensor plate by hand (downdraft). The same resistance must be felt over the entire movement.

Move the sensor plate rapidly back to a position just in front of the zero stop. The control plunger follows this rapid movement of the sensor plate only sluggishly, and therefore initially loses contact with the sensor plate lever. It must be possible, however, to feel the plunger make contact with this lever again. If this condition is fulfilled, the control plunger can be considered to move freely.

If the control plunger does not move freely, remove the fuel distributor from the air-flow sensor.

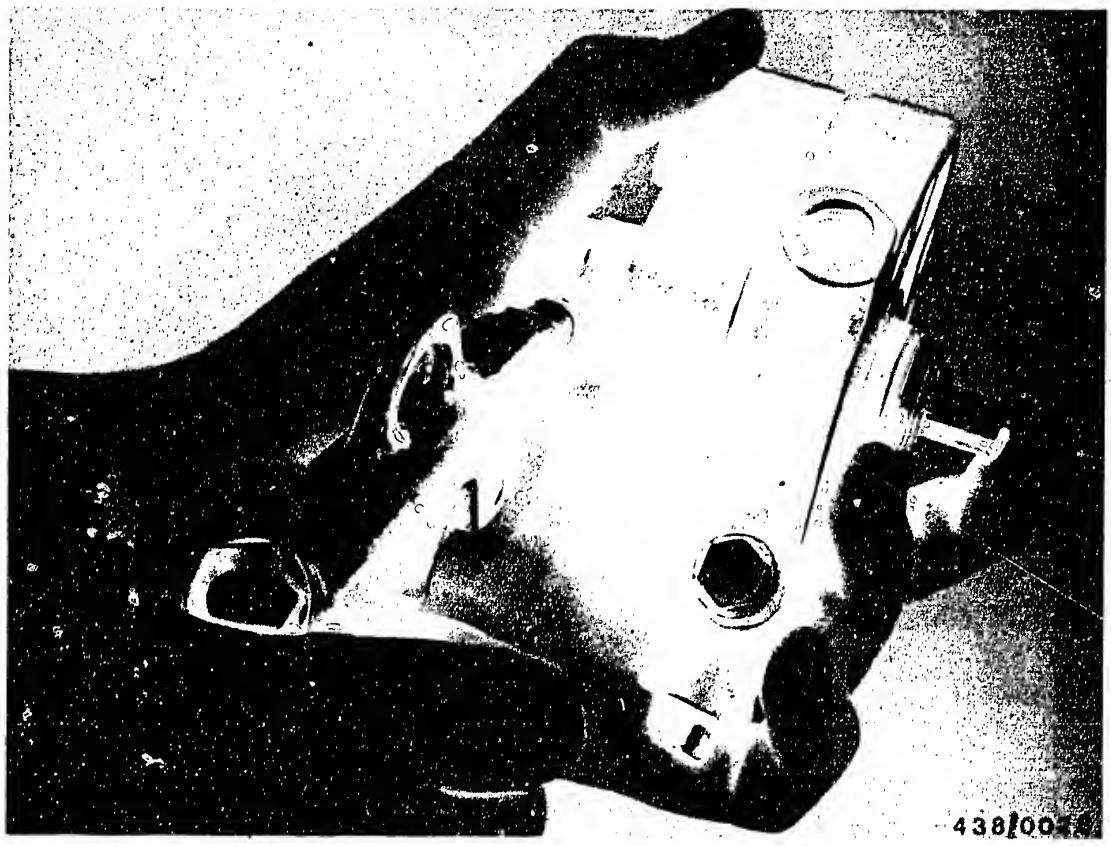
Important!

Note the following when installing fuel components and fuel lines:

Always ensure utmost cleanliness when loosening or tightening the fuel connections. No dirt must enter the fuel system.

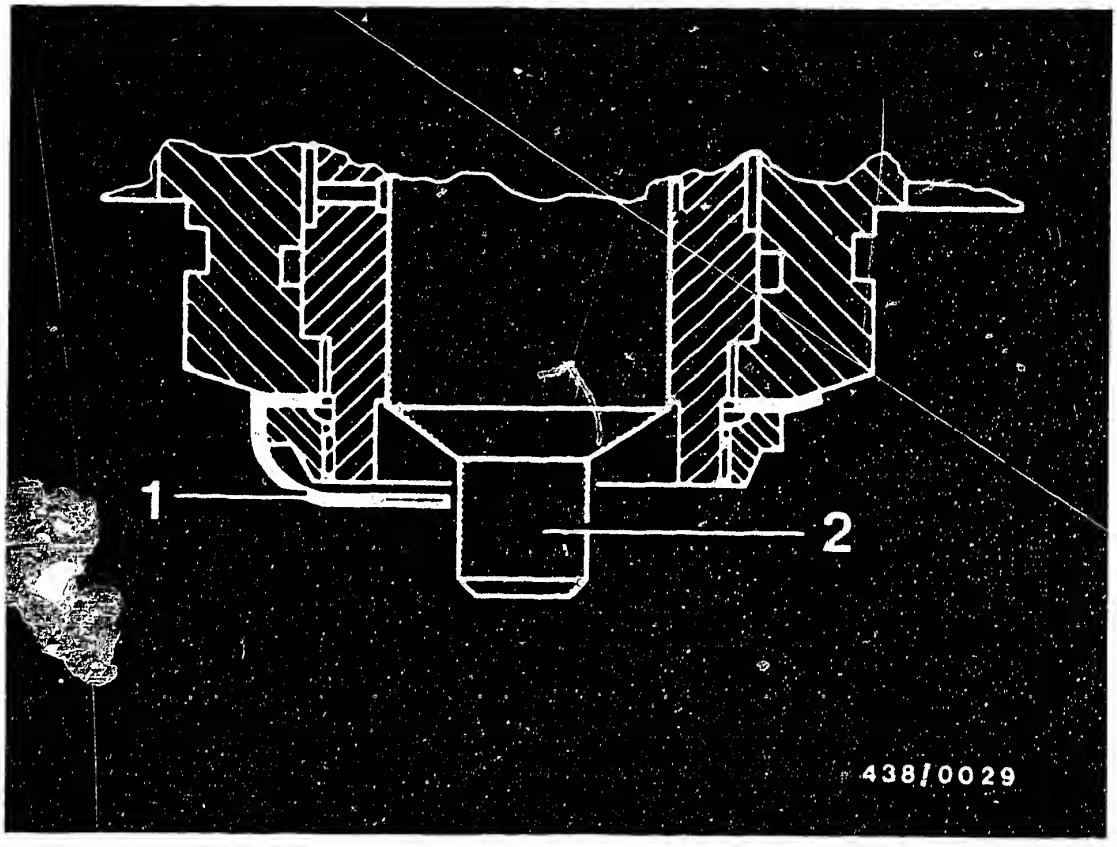
When loosening or tightening the fuel connections, apply counter-force at the fixed hexagon of the component.

Clean the fuel distributor thoroughly in the region of the fuel connections. Screw off all connections.



Screw out three fastening screws and remove the fuel distributor from the air-flow sensor.

Remove the plunger. Under certain conditions, in order to do this it may be necessary to blow compressed air briefly against the plunger through the control-pressure connection hole. Hold the plunger with your hand while doing this. Clean the plunger thoroughly with benzine. If the plunger still does not move freely, replace the fuel distributor

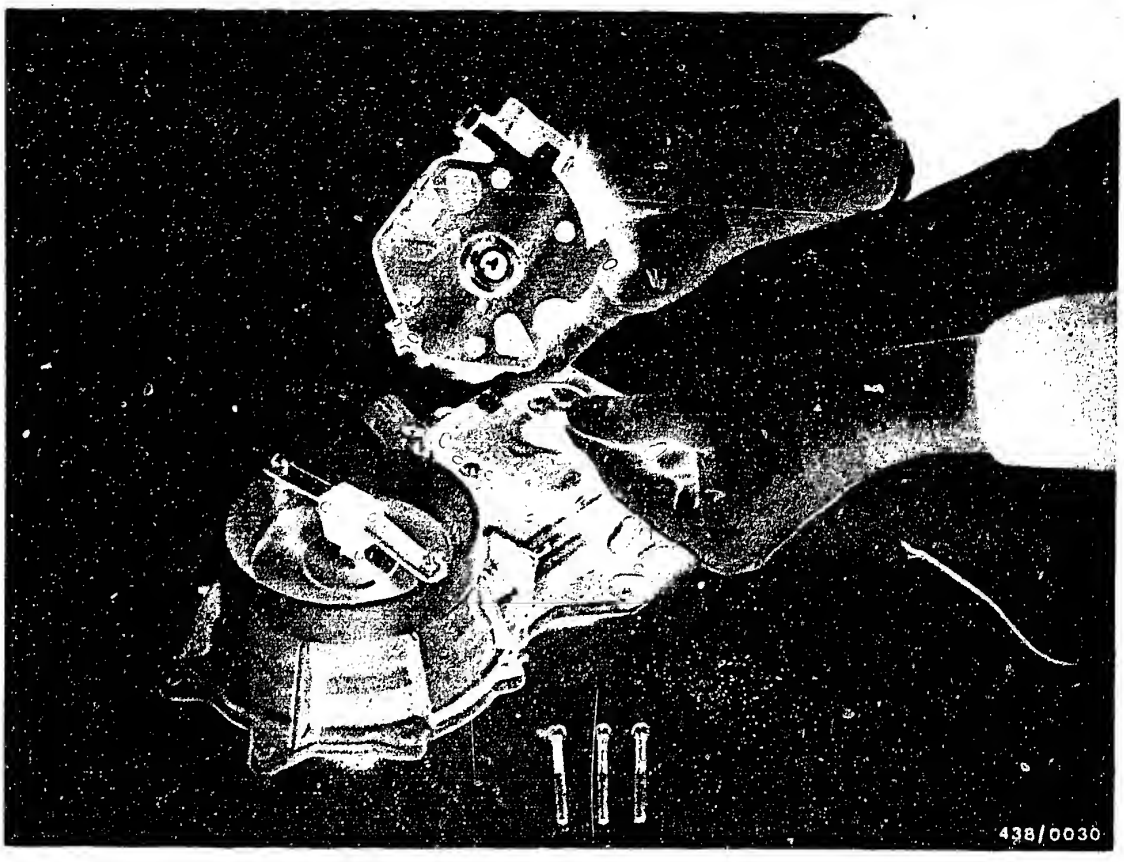


1 = Anti-drop-out device
2 = Control plunger

9.4 Fuel distributor with anti-drop-out device for the control plunger

Caution!
The fuel distributors have an anti-drop-out device for the control plunger.
This also protects the plunger in transit and facilitates installation.

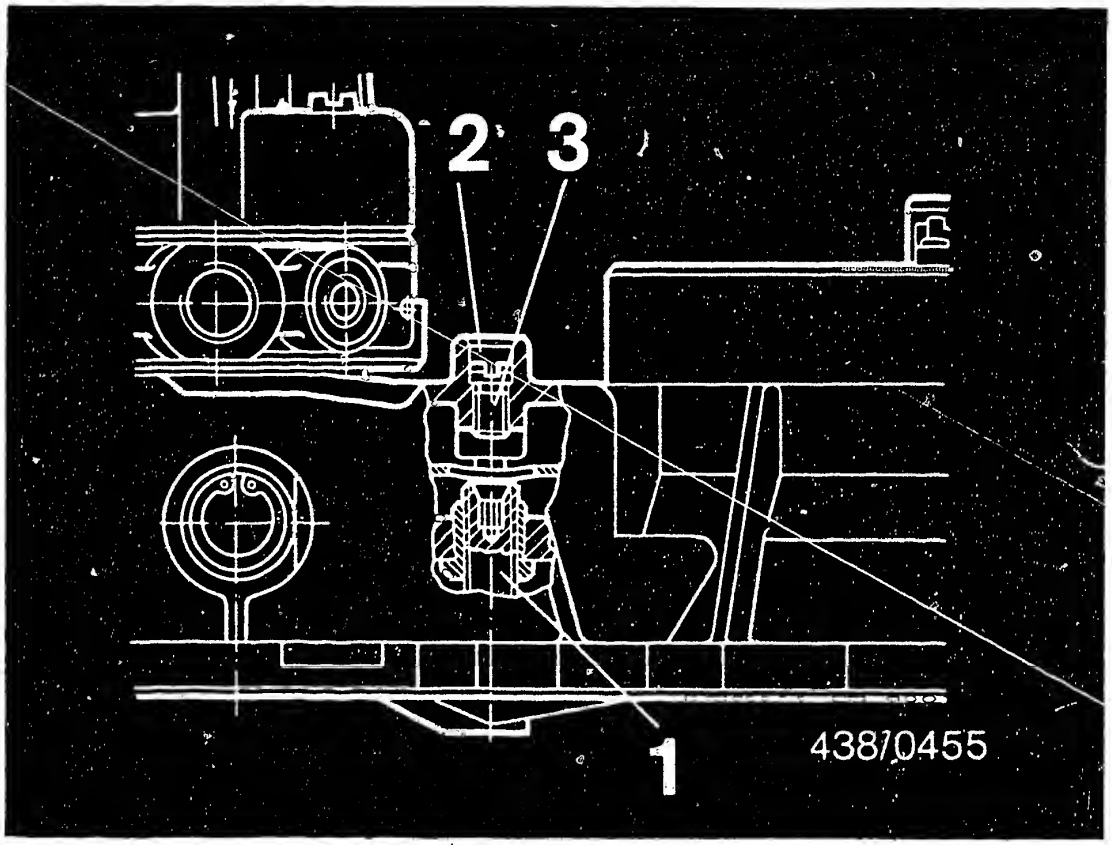
The anti-drop-out device must not be removed!



9.5 Fitting the fuel distributor

When fitting the fuel distributor, use a new seal ring between fuel distributor and air-flow sensor.
Observe the tightening torque 3.2...3.8 Nm (0.32... 0.38 kgfm) for the fastening screws precisely.
When connecting the fuel-injection tubing, use new seal rings.

Caution:
The connection screws of the fuel-injection lines on the fuel distributor should be tightened to a torque of 10...12 Nm (1...1.2 kgfm); if tightened too much, there is the danger that the lines may be crushed.

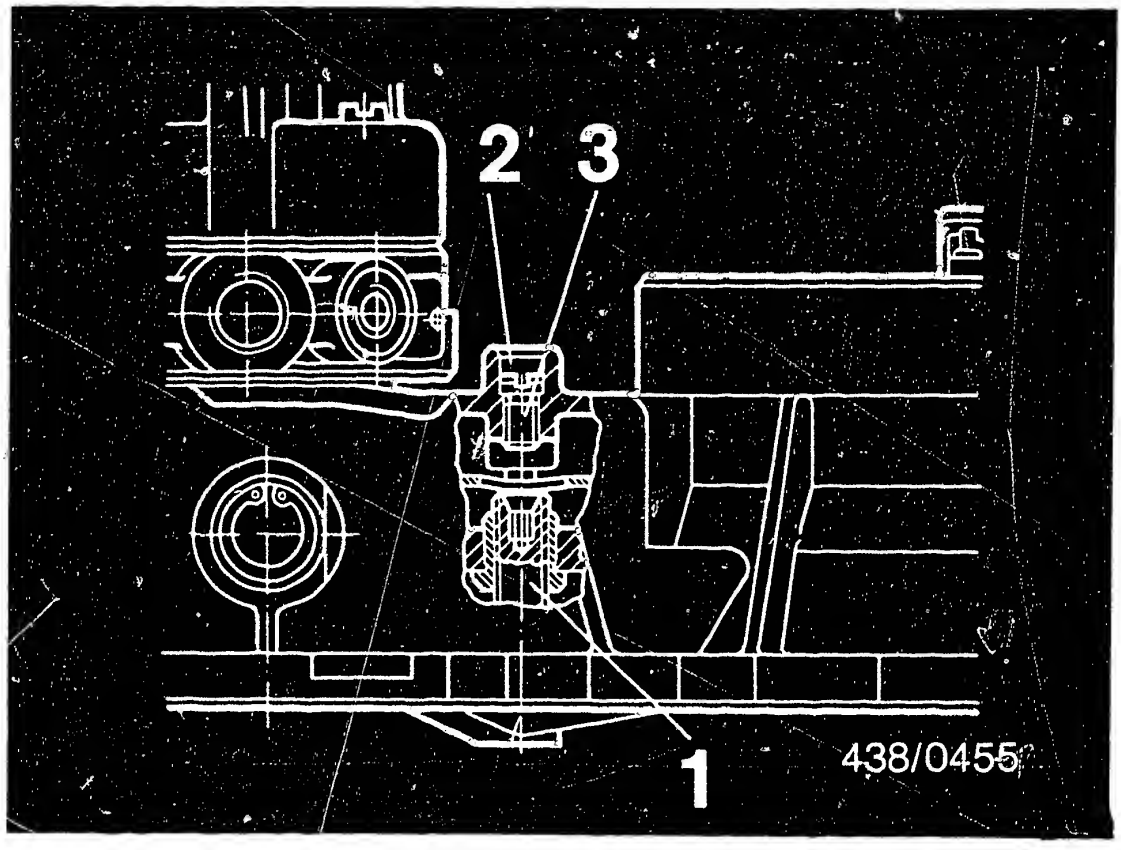


1 = Idle-mixture-adjusting screw
2 = Lead seal
3 = Screw plug

9.6 Matching the fuel distributor to the air-flow sensor for initial starting

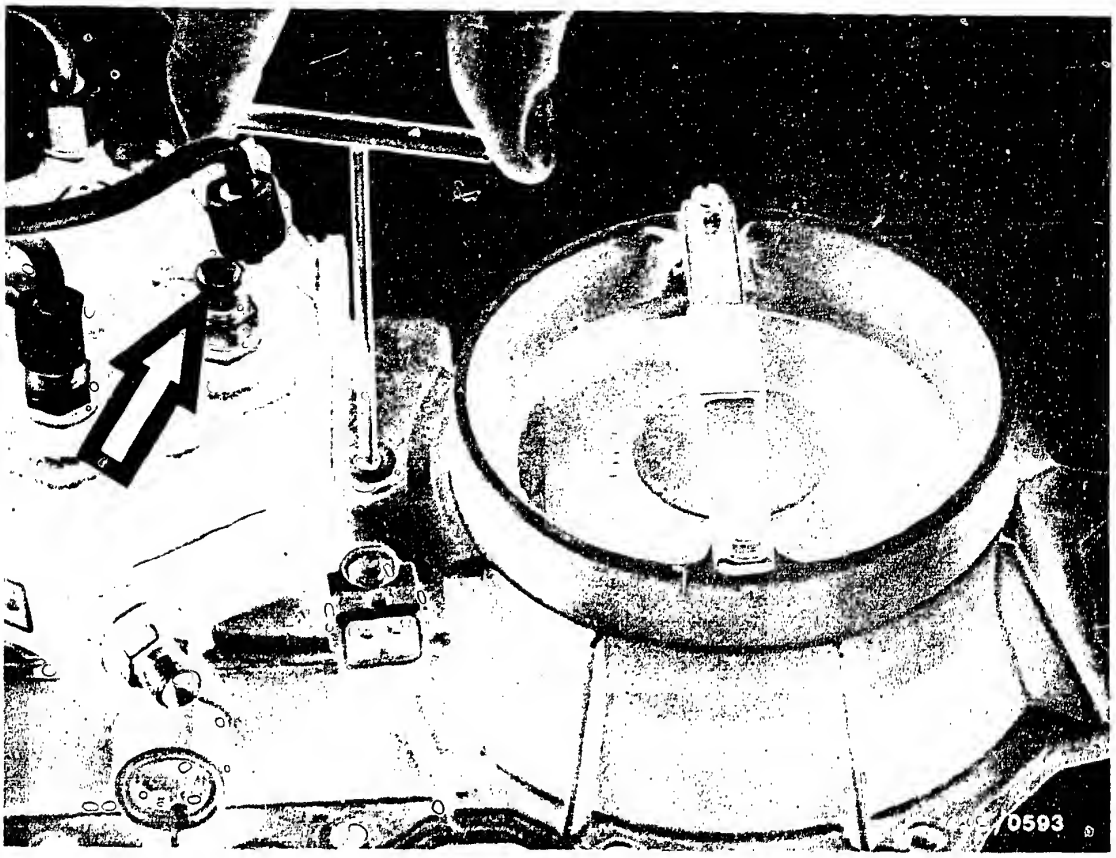
Screw off one fuel-injection line from the fuel distributor. Bridge the electrical safety circuit so that the electric fuel pump operates.

The bore to the idle-mixture-adjusting screw (1) is closed off by a screw plug (3) and an anti-tamper device (lead seal) (2).



1 = Idle-mixture-adjusting screw
2 = Lead seal
3 = Screw plug

Remove the anti-tamper device and unscrew the screw plug. Insert the adjusting wrench KDEP 1035 through the bore into the idle-mixture-adjusting screw.



Screw in the idle-mixture-adjusting screw slowly and without exerting any great pressure on the adjusting wrench until fuel is just delivered from the open outlet (arrow) of the fuel distributor. Then turn back the adjusting screw by 1/2 turn.

Re-connect the fuel-injection line to the fuel distributor, start the engine and warm up.

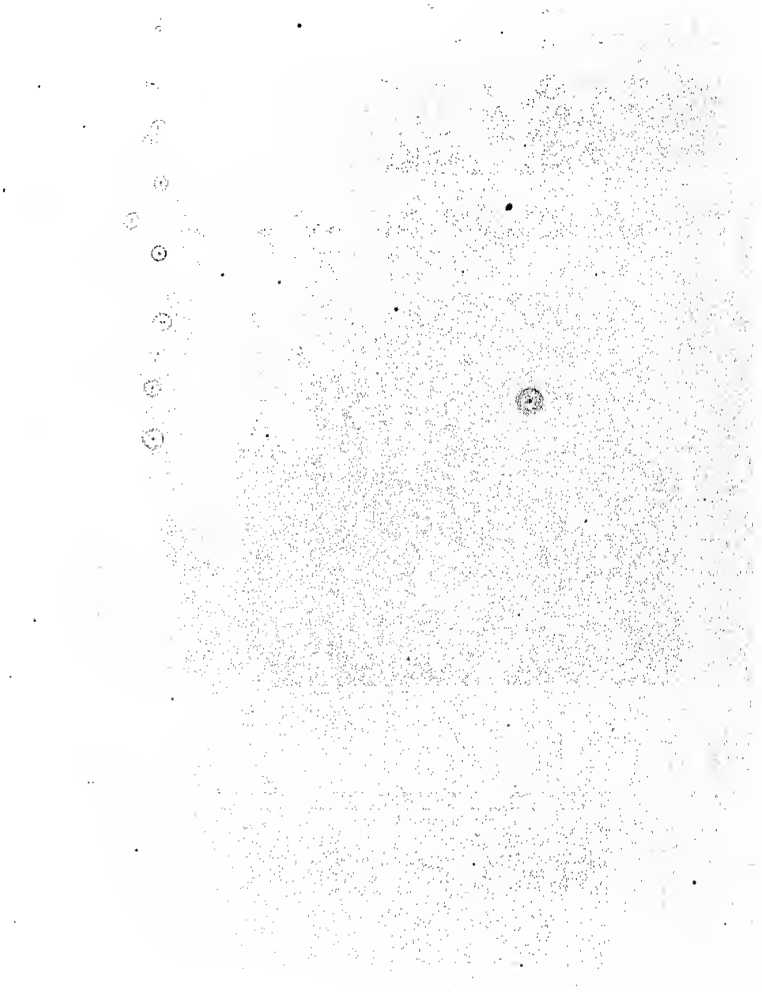
The final matching of air-flow sensor and fuel distributor is carried out by adjusting the idle speed with the engine at normal operating temperature.

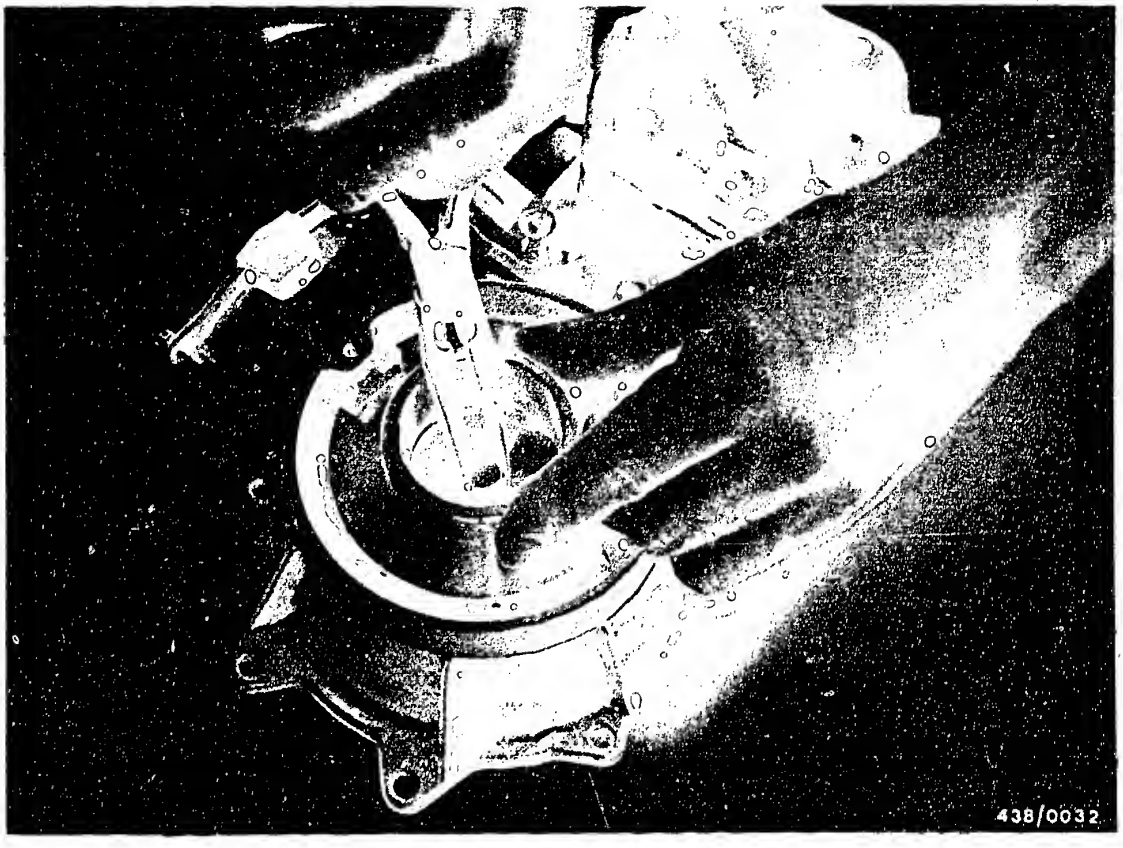
Idle-speed adjustment is described on Coordinate F 5.

10. Checking and adjusting the position of the air-flow sensor plate

10.1 Preparations

- Engine temperature is not important.
- Remove the air filter so that the air-flow sensor plate becomes accessible.



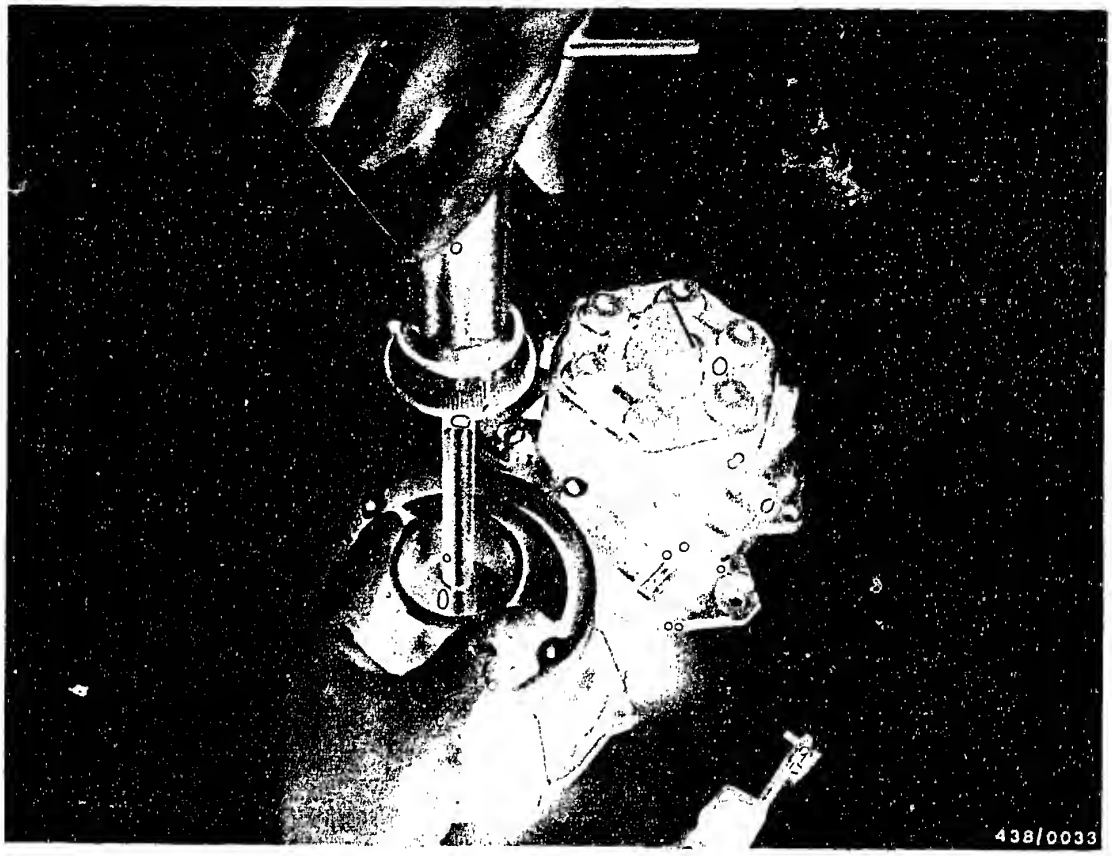


10.2 Centering the air-flow sensor plate

Check that the sensor plate is flat (not bent) and that it can move through the narrowest part of the air funnel without touching the funnel. If necessary, center it using a positioning ring KDEP 1040/13 (dia. 85mm) as follows:

Remove the stop bracket after loosening the two fastening screws.

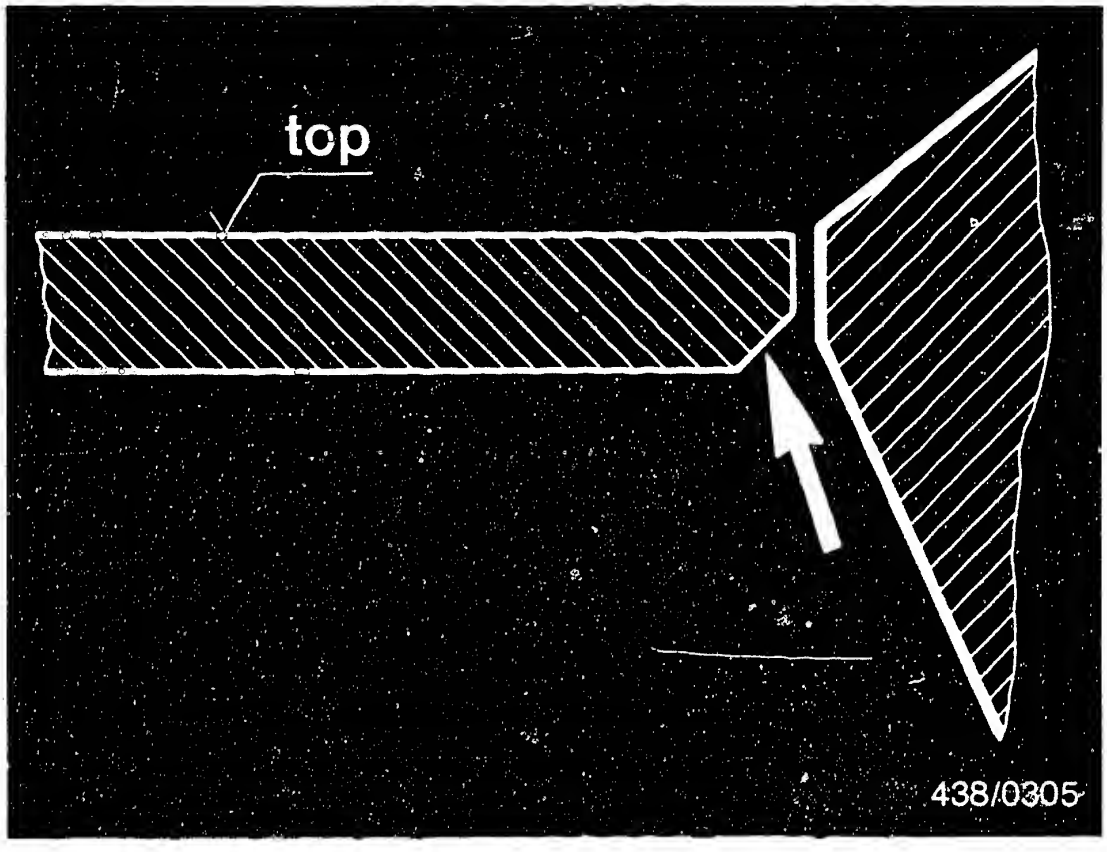
Loosen the sensor plate fastening screw. Insert the positioning ring while holding the fastening screws with pliers so that the sensor plate does not deflect downwards.



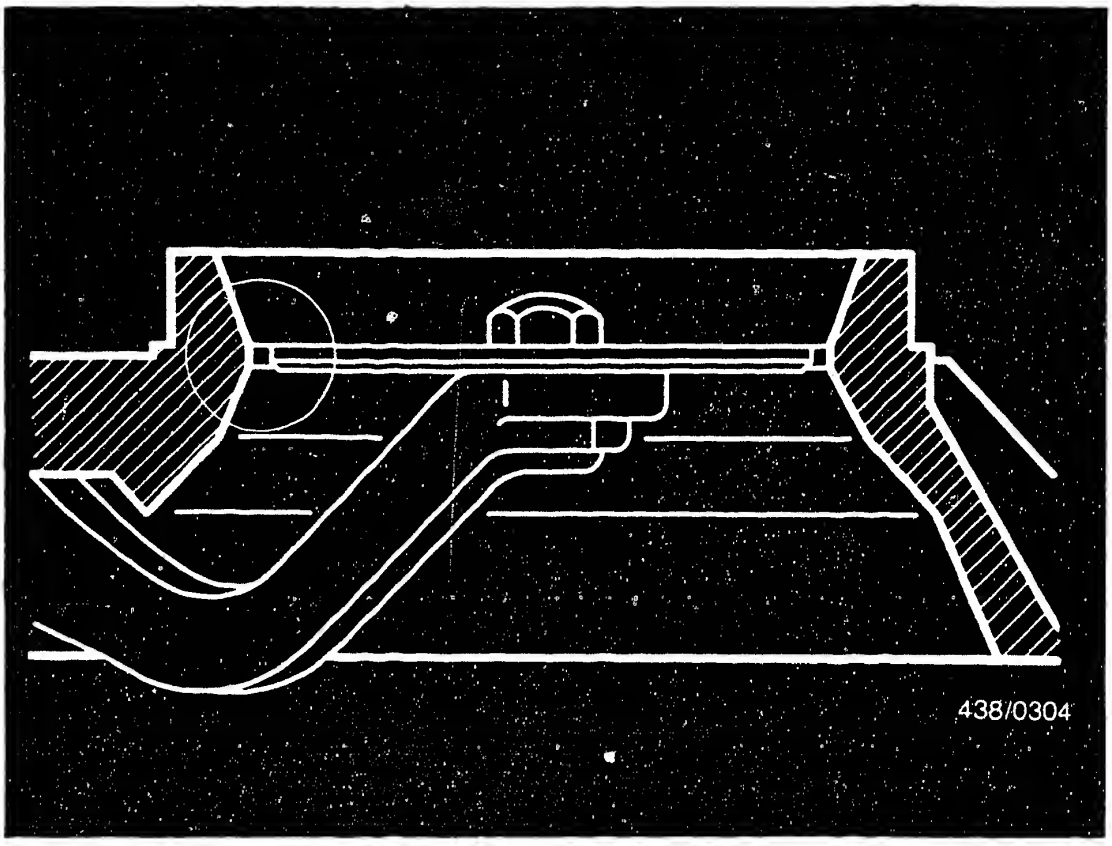
With the positioning ring in place, tighten the fastening screw with a torque of 5.0...5.5 Nm, loosen again and tighten again with the same torque.

When tightening the screw make sure that the air-flow sensor plate is in its zero position (in the cylindrical part of the air funnel).

It must no longer be possible to turn the air-flow sensor plate by hand.



Caution:
The lower edge of the sensor plate is partially chamfered. Be absolutely sure that this chamfered edge is on the bottom (arrow). The upper side of the sensor plate is (in some cases) marked by the word "top".

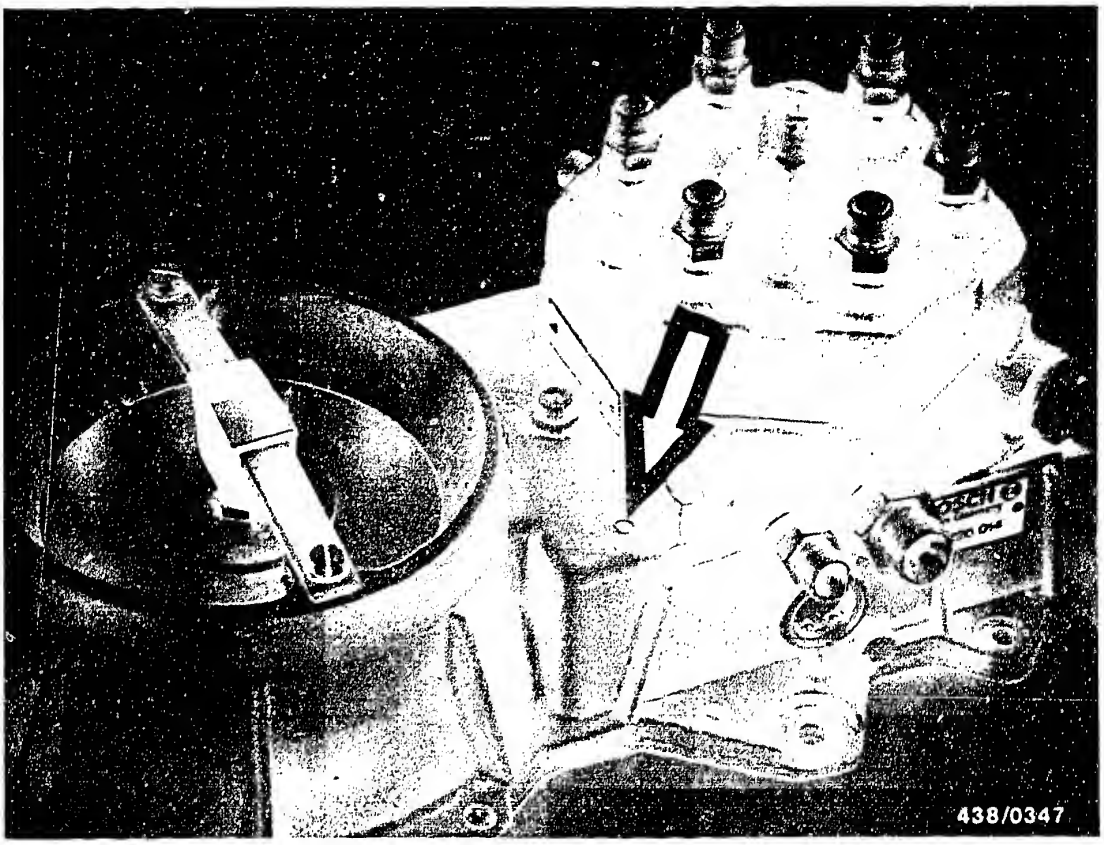


10.3 Checking and adjusting the zero position of the sensor plate
(Rest position):

Switch on the electric fuel pump for approx. 10 seconds by bridging the safety circuit.
This results in application of the control pressure to the control plunger in the fuel distributor.

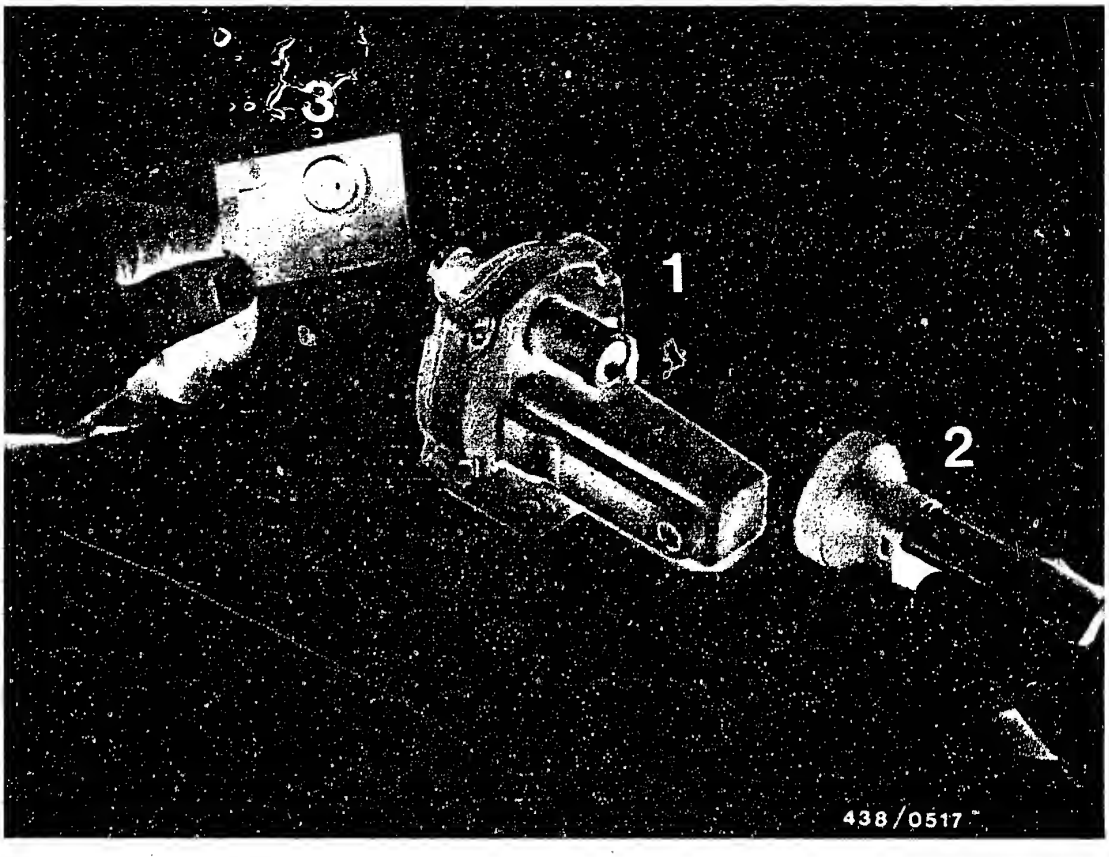
The upper edge of the sensor plate must be flush with the beginning of the cone (relief funnel, top) or max. 0.5 mm higher.

The air-flow sensor plate must be flat and must not project at any point on its circumference outside the cylindrical part of the air funnel.



If the sensor plate is positioned too high, an adjustment can be made. To do this, drive the guide pin (arrow) for the leaf-spring limit-stop deeper using a mandrel and a light hammer.

Caution:
Make this adjustment very carefully so that the guide pin is not driven in too far.
Be absolutely sure to avoid repeated adjustments in both directions because this can loosen the press fit of the pin. Serious engine damage can result if this pin should drop out.



1 = Auxiliary-air device
2 = Flashlight
3 = Mirror

11. Checking the operation of the auxiliary-air device.

The engine must be cold.
Disconnect the electric cable plugs from the auxiliary-air device and warm-up regulator.
Disconnect both air hoses from the auxiliary-air device.
Since the two hose fittings on the auxiliary-air device are located exactly opposite each other, a visual check can now be made to see if the blocking plate is partially open.
It will be easier to look through the auxiliary-air device with the aid of a flashlight and a mirror, as shown in the illustration.

- If an opening is not visible with the engine cold, replace the auxiliary-air device.

- Fit the electric cable plug on the auxiliary-air device.

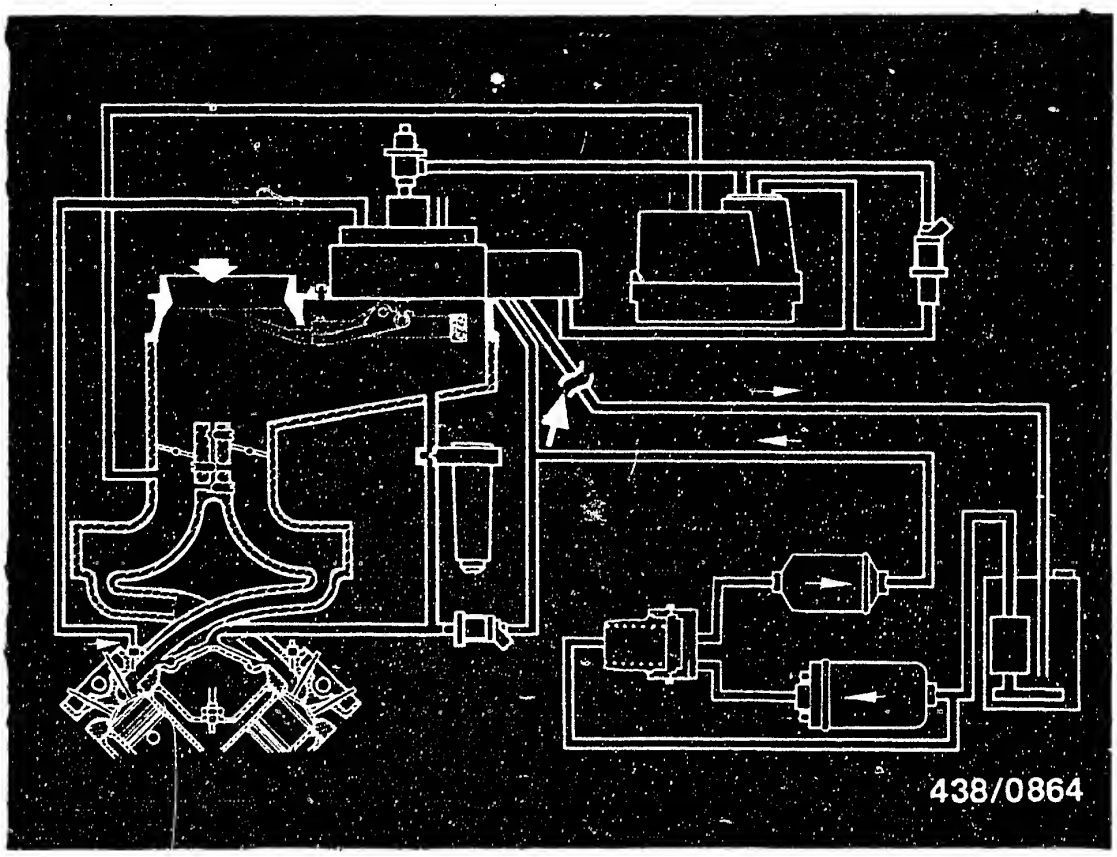
- By bridging the electrical safety circuit, supply power to the auxiliary-air device.
  After a maximum of 10 minutes, the opening in the auxiliary-air device must be completely closed by the blocking plate.

- If the blocking plate does not close, check the power supply (open circuit, voltage drop).
  Minimum voltage across the connector 11.5 V with the engine stopped.

- If these points are O.K., check the heating coil of the auxiliary-air device for an open circuit using an ohmmeter.

- Replace the auxiliary-air device if defective.

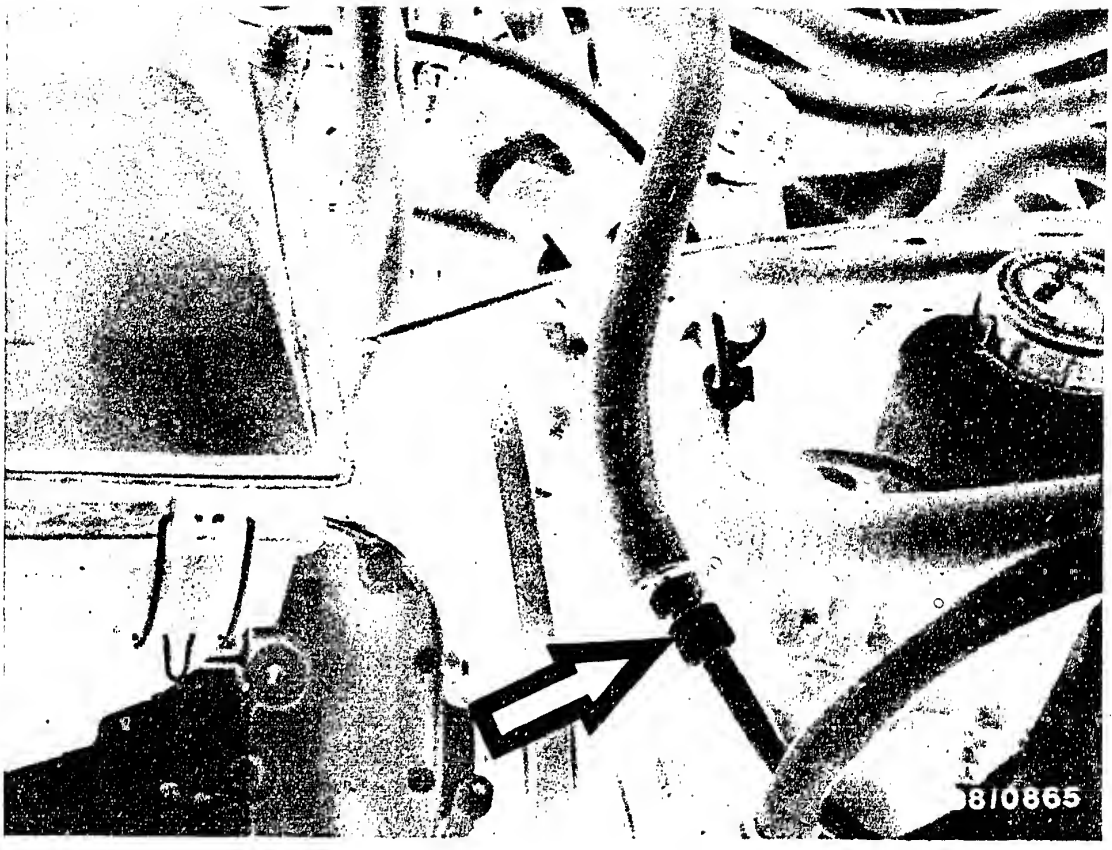
When the auxiliary-air device has been replaced, readjust the idle speed with the engine at normal operating temperature. Idle adjustment is described on Coordinates F 5.



12. Checking the operation of the electric fuel pump

12.1 Requirement

Conclusive information on the operation of the electric fuel pump can only be given by a measurement of fuel delivery under pressure, i.e. under primary (system) pressure. This measurement must therefore be made at the return line leading to the fuel tank (arrow).



12.2 Measuring point:

A suitable measuring point for testing the fuel delivery is the screw connector (arrow) in the fuel return line to the fuel tank.
Undo the connector and hold the hose (coming from the fuel distributor) in a graduate (approx. 1.5 litres capacity) in order to make the measurement.

12.3 Testing:

Remove the plugs from the warm-up regulator and auxiliary-air device.

Switch on the electric fuel pump for precisely 30 seconds by bridging the safety circuit and measure the delivery in a graduate.

12.4 Test specification

Fuel delivery: min. 950 cm^3/30 seconds

12.5 Possible causes of insufficient fuel delivery:

- Power supply to the electric fuel pump defective, voltage drop.
  Necessary minimum voltage at terminal with pump operating = 11.5 V.
- Fuel filter very dirty.
- Pre-supply pump not operating.
  Carry out noise test, if necessary with the main electric fuel pump switched off.

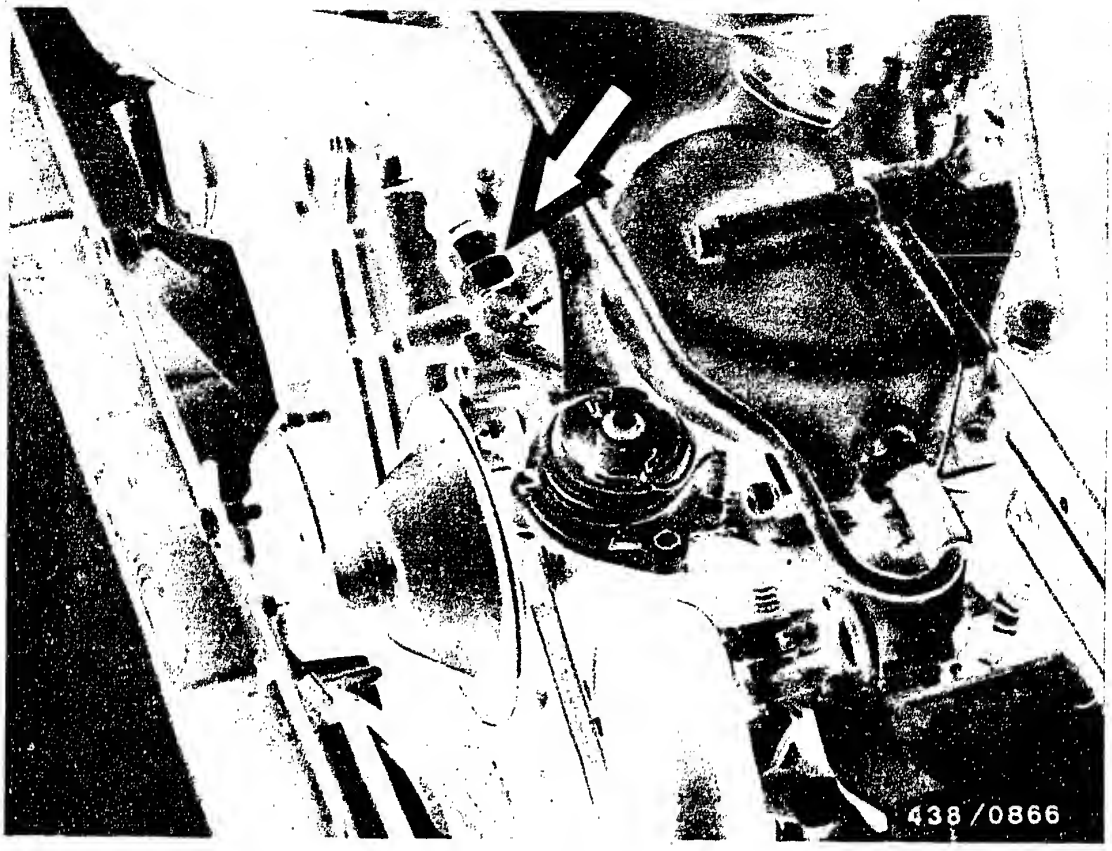
In the case of doubt, pull the hose away from the intake fitting of the main fuel supply pump and hold it in a measuring graduate. Compare the fuel flowing out.
With the primary fuel supply pump switched on, more fuel must flow than when it is switched off.

If the above-mentioned points are O.K., the cause lies with the electric fuel pump itself.
Replace the electric fuel pump.

12.6 Removal and installation of the electric fuel pump:

Pinch off the fuel intake hose from the fuel tank to the electric fuel pump (e.g. using hose clamper W 157 from Matra Co.).

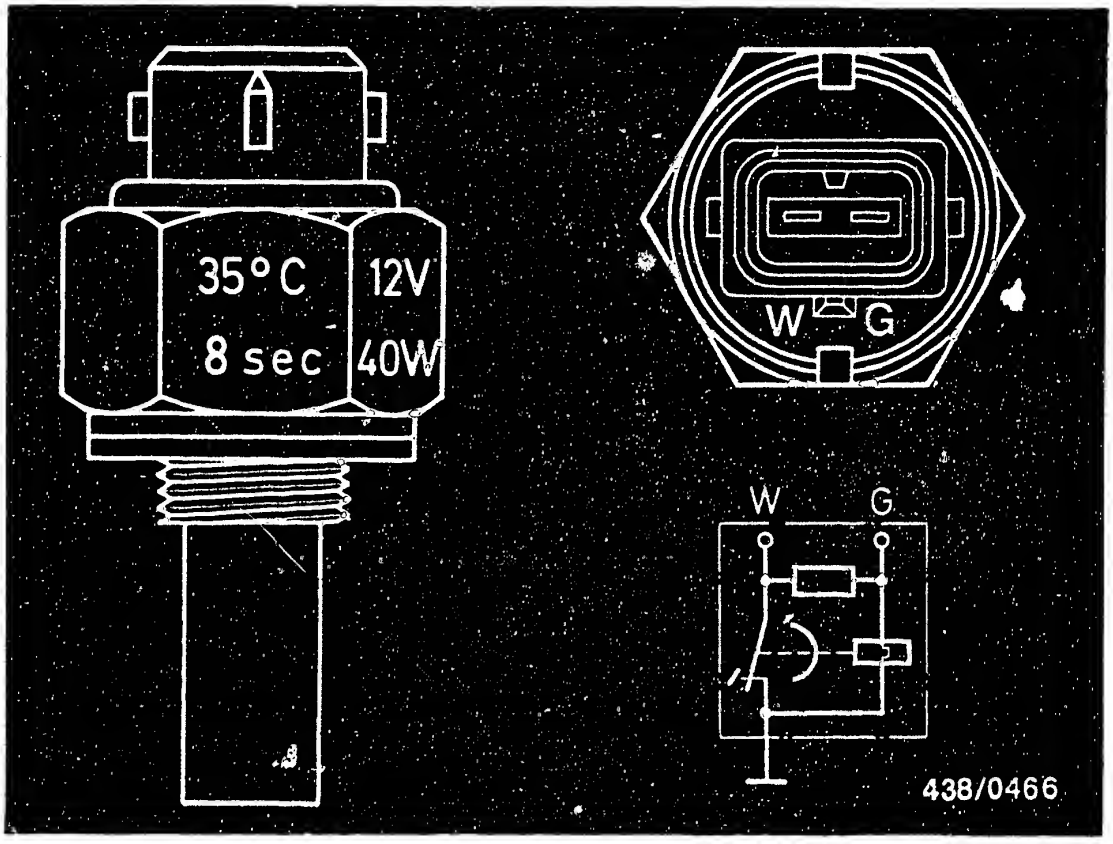
When installing, use a new seal and pay attention to the correct positioning of the electric fuel pump. Danger of bending the fuel lines.



13. Checking the cold-start system (thermo-time switch, cold-start valve).

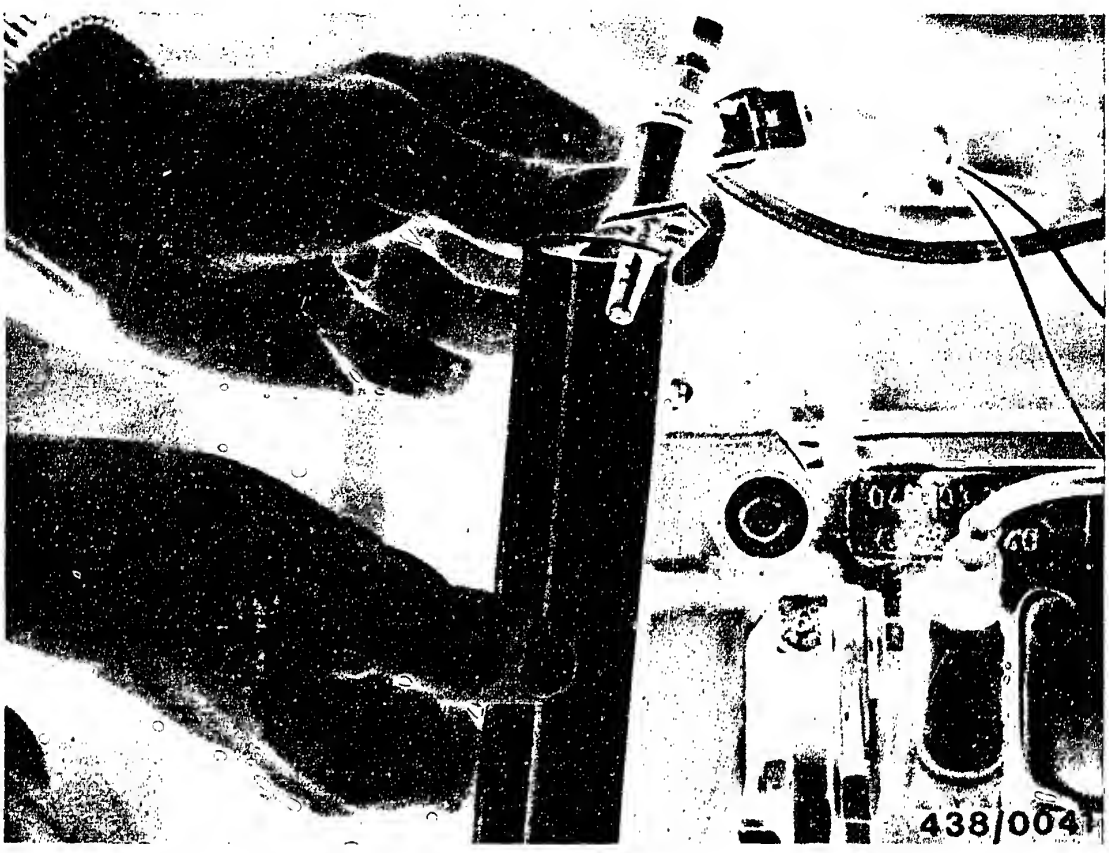
13.1 Thermo-time switch

Remove the thermo-time switch (arrow) for testing. It is to be found on the forward end face of the cylinder head in the cooling-water distribution fitting.
Collect any escaping coolant in a container.



The switching temperature +35°C and the switching time at -20°C of 8 seconds are stamped into the hexagonal section of the thermo-time switch. The removed thermo-time switch is tested using the ohmmeter in accordance with the specifications given below.
The temperatures for the thermo-time switch can easily be obtained with water. Cooling takes place in a freezer chest.

At a temperature below °C	above °C	Resistance measurement (Ω) between Term."G" and "ground" (housing)	Term. "W" and "ground" (housing)	Term. "G" and term. "W"
+30		25...40	0	25...40
	+40	50...80	100...160	50...80



13.2 Start valve:

Remove the start valve for testing. The fuel line remains connected. As of the 1981 model, replace the steel fuel line by a flexible hose line for testing (e.g. hose of the pressure tester).

Pull off the plug and connect the start valve directly to ground and terminal 15 (e.g. at the ignition coil) using connecting cable KDJE 7450/70.

Important note:

Do not hold the connecting cable against B+. Danger of fire due to sparking!

Hold the start valve in a suitable container (e.g. graduate).

Switch on the electric fuel pump by bridging the safety circuit.

Switch on the ignition (max. 30 seconds). The start valve must now open and spray fuel.

Switch off the ignition, remove the electric connecting cable and dry the nozzle of the start valve.
The safety circuit remains bridged so that the primary pressure is applied to the start valve.
No droplets of fuel must drip from the nozzle of the start valve during the next minute. Even if shaken and knocked, the start valve must not leak.
Then switch the electric fuel pump off again.
Replace the start valve if it does not open or if it leaks.

If a leaky start valve or a defective thermo-time switch has been replaced, it is necessary finally to adjust the idle speed with the engine at normal operating temperature.
Idle-speed adjustment is described on Coordinates F 5.

14. Checking the control pressures

14.1 Preliminary remarks:

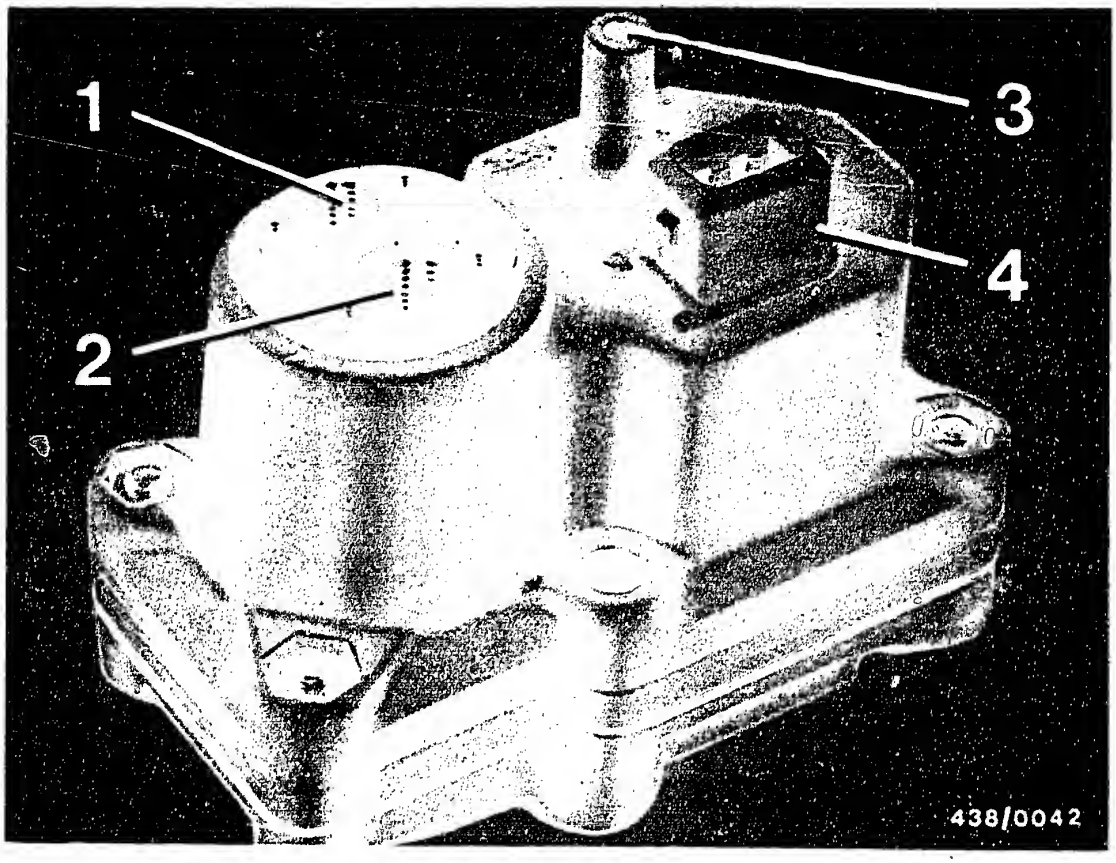
The control pressures tested in the following are in each case governed by the warm-up regulator.
If the test results are incorrect, however, this may also be due to faults which have nothing to do with the warm-up regulator.

These possible faults are:

- No or too low a voltage at the electric connector.
- Fuel return from the warm-up regulator blocked or constricted.
- Too high a fuel delivery for the control-pressure circuit.
- Leaky pressure-reduction valve (1979/1980 models)
- Leaky fuel-line-pressure damper (as from 1981 model)

The testing of this control-pressure delivery is described as an additional test step at the beginning of the control pressure tests.
Test specification: 160...240 cm^3/min.

Reference is made to the other possible causes of trouble in the respective test step.

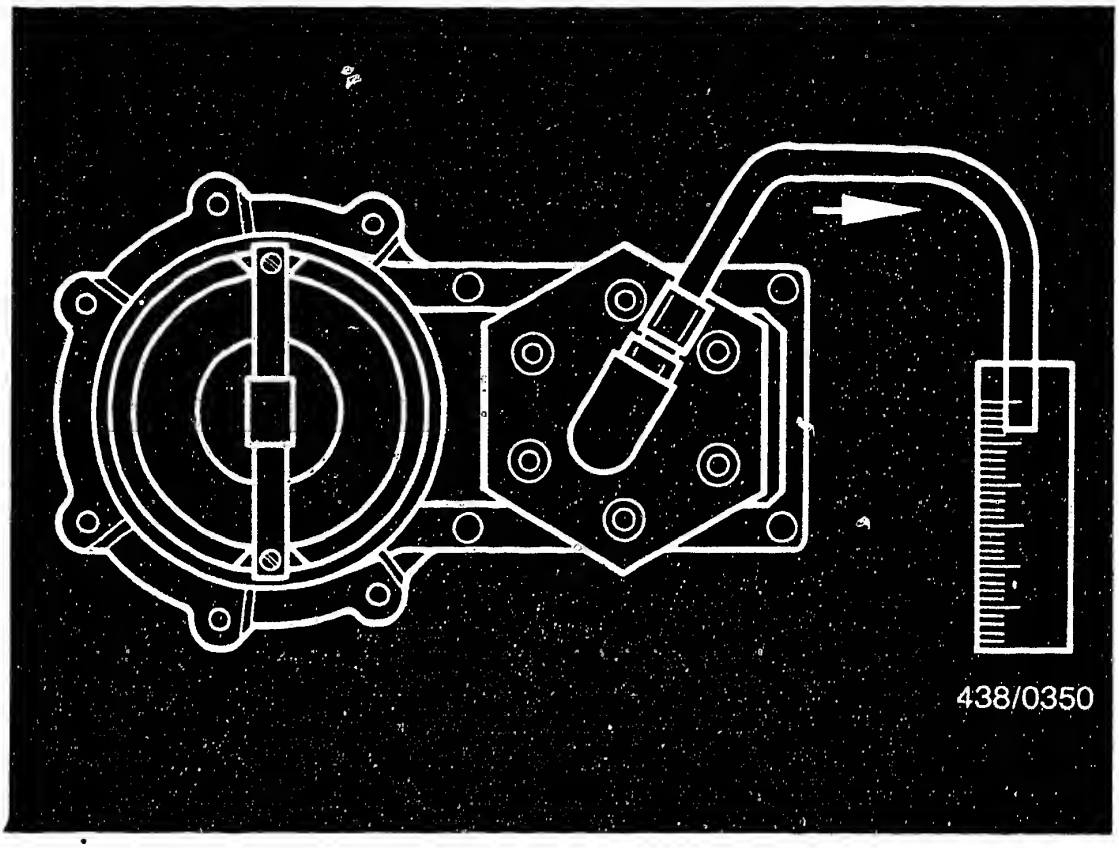


1 = Return connection (M 8 x 1)
2 = Inlet connection (M 10 x 1)
3 = Connection for intake-manifold pressure (downstream of throttle valve)
4 = Electric connection

14.2 Warm-up regulator versions

- Warm-up regulator No. 0 438 140 038

The warm-up regulator is a version for intake-manifold-pressure-controlled full-load enrichment. This means that the cold and warm control pressures are additionally influenced by the intake-manifold pressure acting on the full-load diaphragm of the warm-up regulator. The intake-manifold connection port (3) is on the top of the housing cover.



14.3 Testing the fuel delivery for the control-pressure circuit:

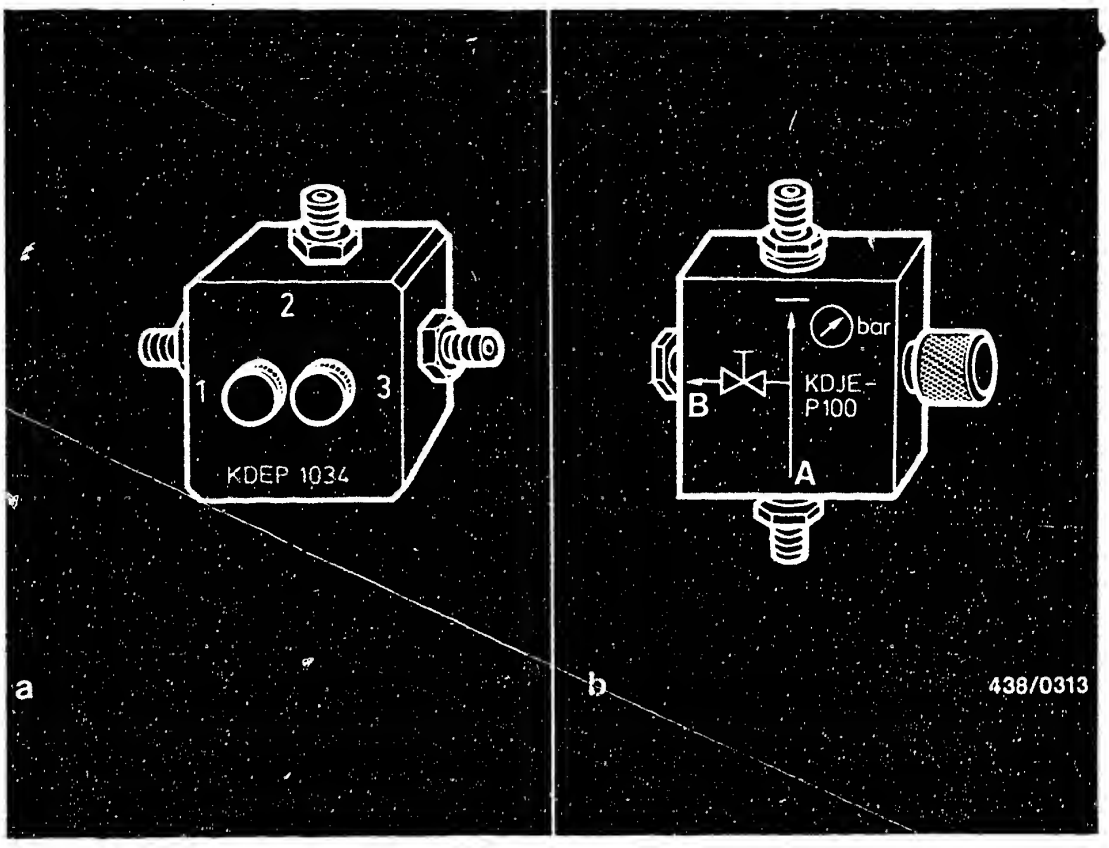
Before testing, make sure that the electric fuel pump is in proper working order.
Test specification: Min. 950 cm^3/30 sec.

As from the 1981 model, connect the hose of the pressure tester instead of the steel control-pressure pipe.

Switch on the electric fuel pump for 1 minute by bridging the safety circuit.
Measure delivery.

Test specification: 160...240 cm^3/min.

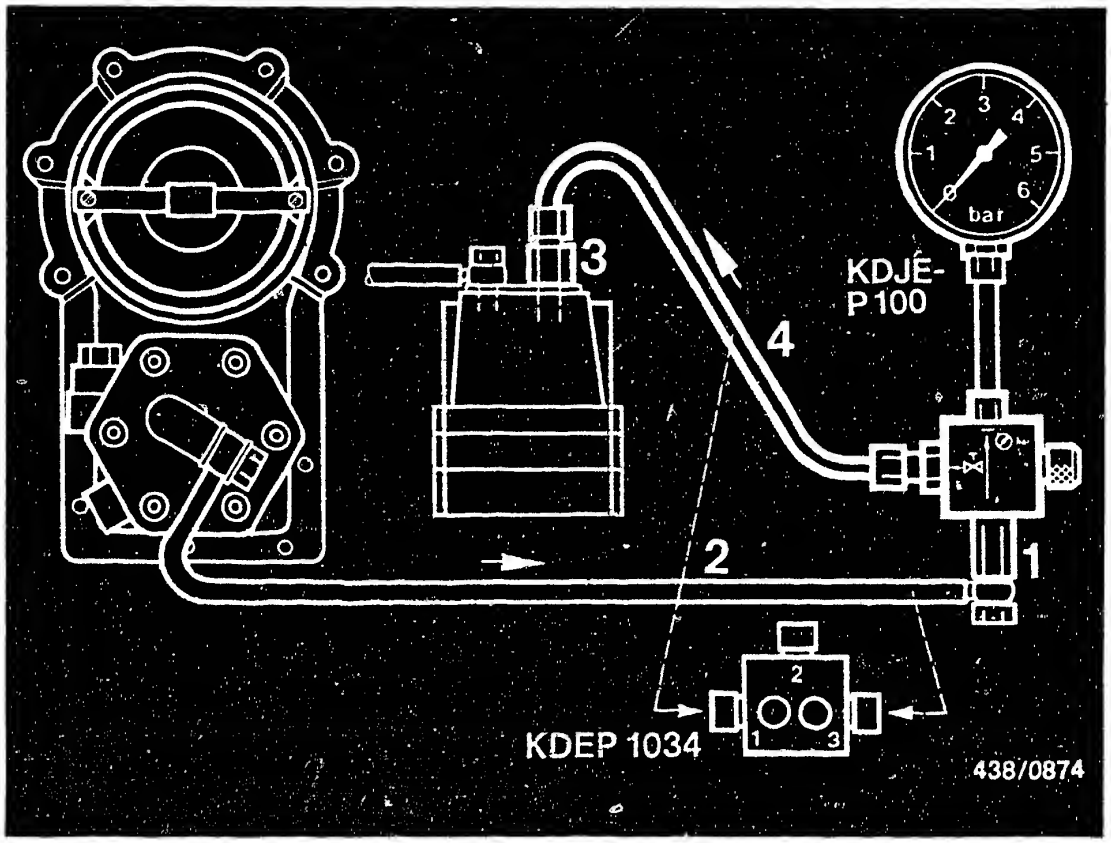
If the measured value is outside tolerance, the fault is in the fuel distributor.
Replace the fuel distributor.



14.4 Mounting the pressure tester KDJE-P 100 (formerly KDEP 1034):

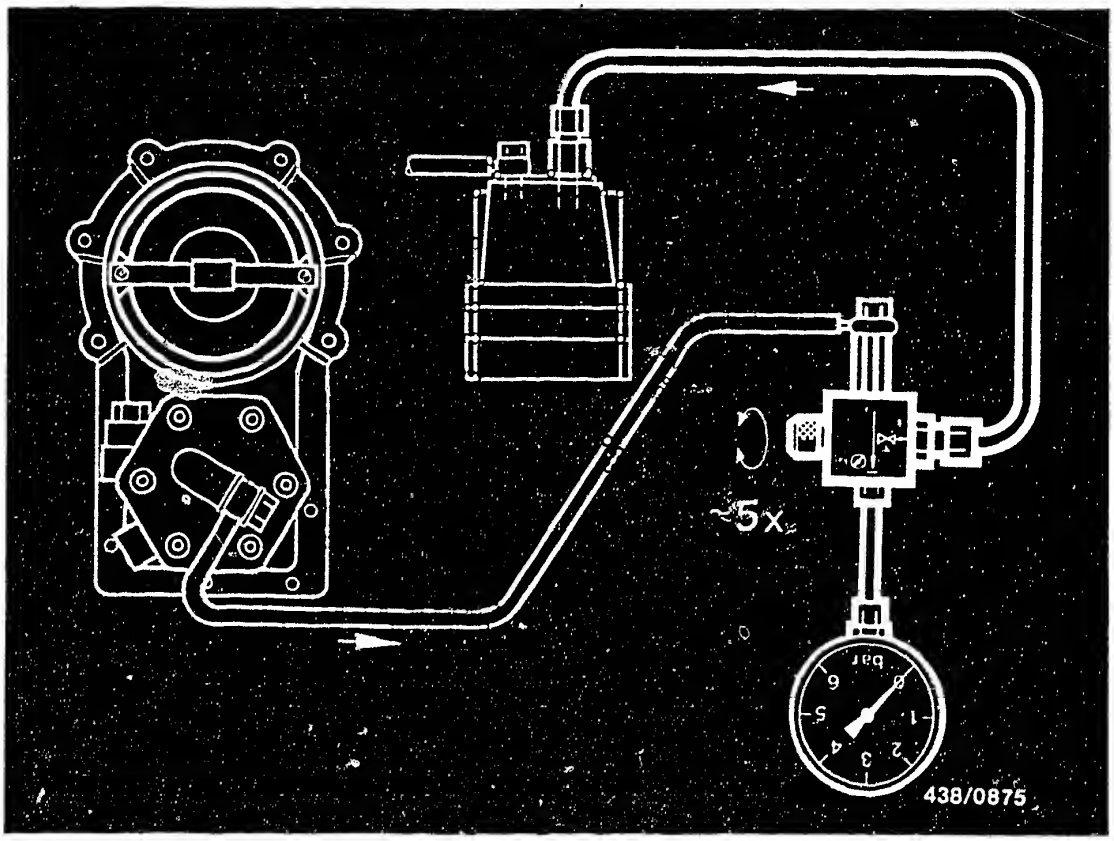
The pressure tester KDEP 1034 is equipped with a three-way valve with 2 separate valve screws. The connections of the directional-control valve are numbered (Fig. a). Since the end of 1979 the pressure tester KDJE-P 100 has been supplied. Its directional-control valve has only one valve screw (Fig. b). The connections of this directional-control valve are identified by symbols:
A = Inlet (from the fuel distributor)
B = Outlet (to the warm-up regulator)

Caution:
When the directional-control valve is not in use, always keep the valve screw(s) open in order to relieve the pressure on the seal rings.



The directional-control valve of the pressure tester is connected into the control-pressure line from the fuel distributor to the warm-up regulator.
Fit using connecting-parts set KDJE-P 100/12.
Screw the adapter (1) with seal onto inlet fitting A or 3 of the directional-control valve.
Unscrew the control-pressure line (2) on the warm-up regulator and connect with inlet-union screw M 10 x 1 and seal rings to the adapter (1).
Screw connecting piece (3) of connecting-parts set into inlet of warm-up regulator and, using hose line (4), connect to outlet fitting B or 1 of the directional-control valve.

Suspend the pressure gauge from the engine hood (possibly using a wire hook).



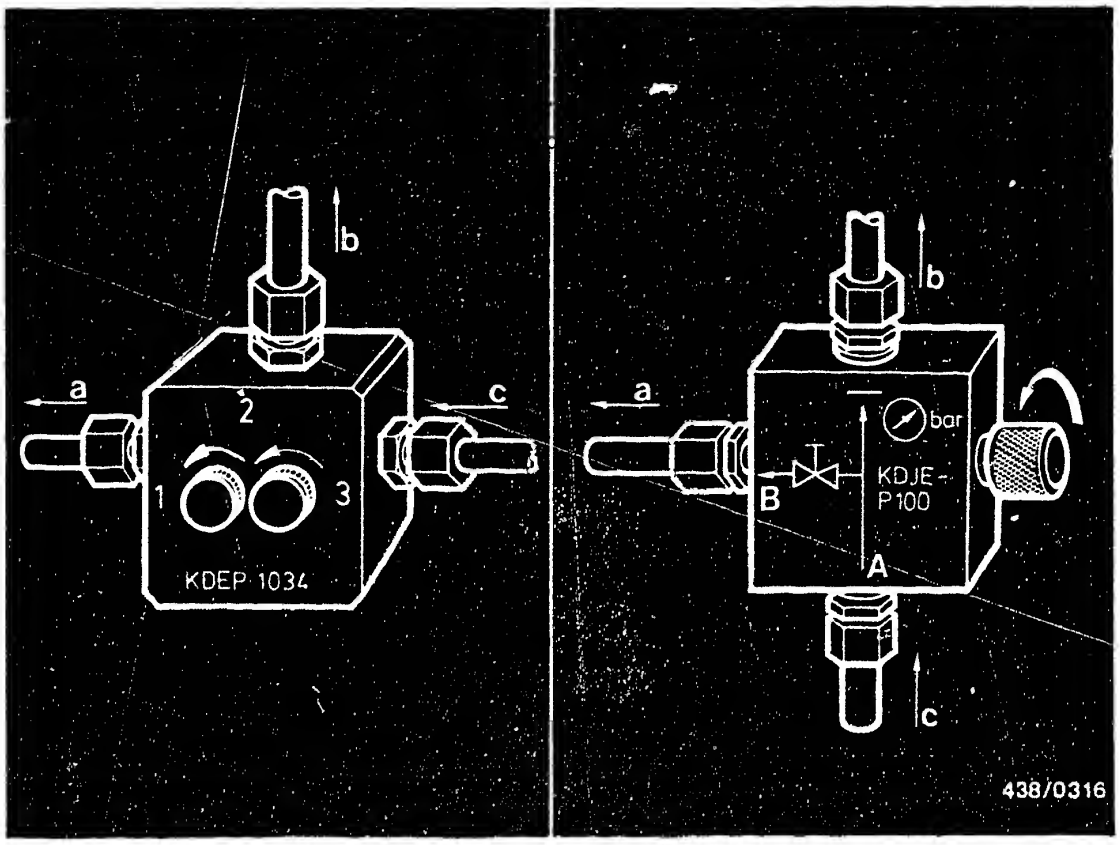
14.5 Bleeding the pressure tester

Disconnect the electric plug from the warm-up regulator
Let the pressure gauge hang down (hose fully extended).

Switch on the electric fuel pump by bridging the electrical safety circuit.

Open and close the valve screw(s) of the directional-control valve in a 10-second rhythm about 5 times.

Then hang the pressure gauge from a suitable support (e.g. from one of the struts under the engine hood).
Open valve screw of directional-control valve (both screws in the case of KDEP 1034) (turning to the left).

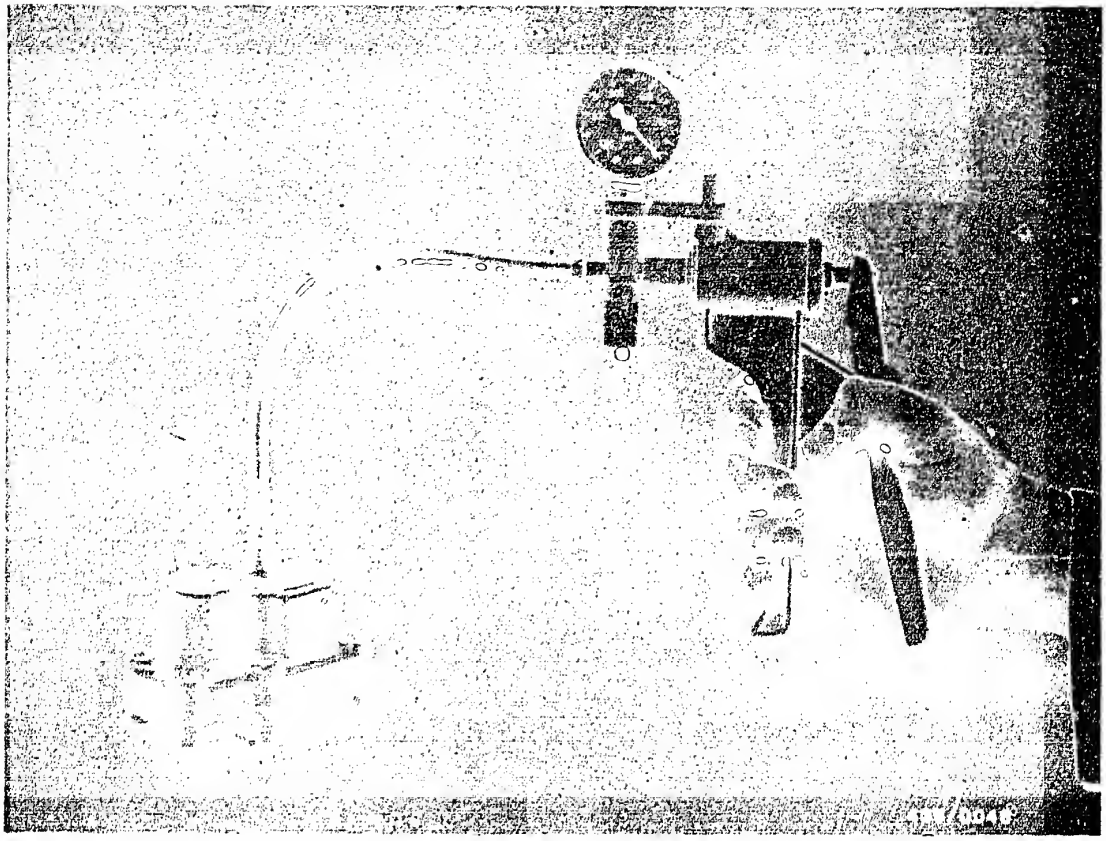


a = To warm-up regulator
b = To pressure gauge
c = From fuel distributor

14.6 Testing the "cold" control pressure:

Warm-up regulator: 0 438 140 038

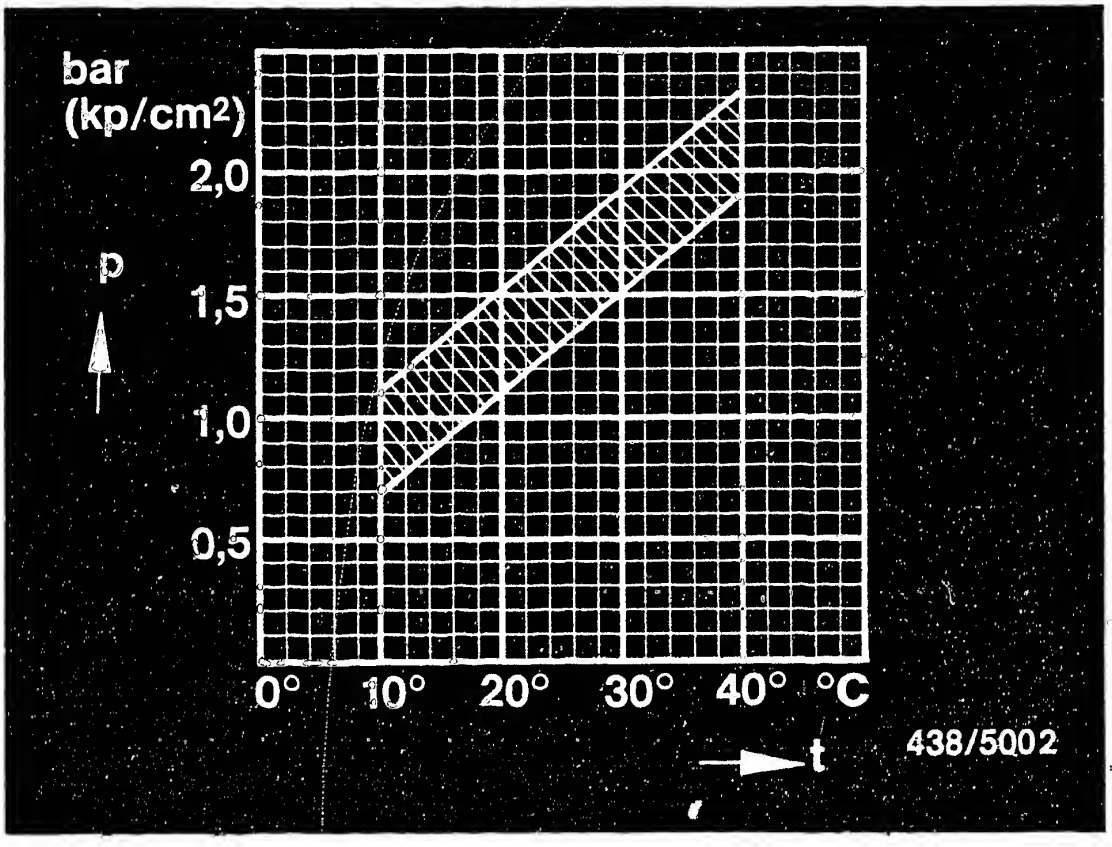
The test is performed with the engine switched off.
The engine must be cold. For this purpose, the engine should have been switched off for several hours, preferably overnight.
Pull off the plug from the warm-up regulator.
Open the valve screw of the directional-control valve (both screws in the case of KDEP 1034).
Switch on the electric fuel pump by bridging the electrical safety circuit.



Part No. of warm-up regulator: 0 438 140 038

The control pressure is checked with simulated intake-manifold pressure, i.e. vacuum is applied to the warm-up regulator.
To do this, connect the vacuum pump to the intake-manifold-pressure connection port of the warm-up regulator on the top of the housing. The picture shows testing with the recommended Mityvac hand vacuum pump.
Setting value for testing: 510...550 mbar
(385...415 mmHg)

The "cold" control pressure is indicated on the pressure gauge of the pressure tester.



p = Control pressure (bar or kgf/cm² gauge pressure)
t = Ambient temperature (°C)

Warm-up regulator Part No.: 0 438 140 038
(full-load enrichment design)

Calculate the nominal control pressure in accordance with the ambient temperatures in the graph.

Example: Ambient temperature = 20°C
Nominal control pressure = 1.1...1.5 bar gauge pressure

If the measured "cold" control pressure differs from the nominal value, this may be due to one of the following faults:

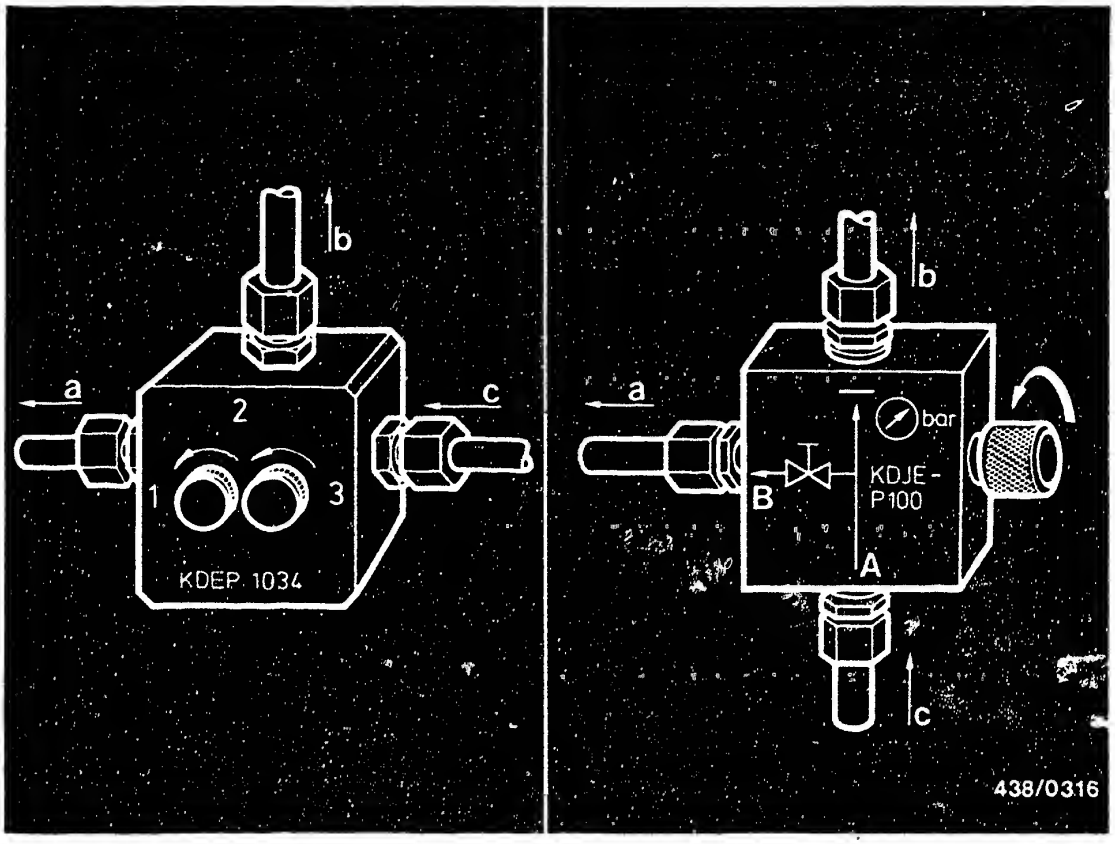
- Fuel delivery for the control-pressure circuit too low or too high. Test fuel delivery.
  Test value: 160...240 cm^3/min.

- Fuel return from warm-up regulator blocked or constricted (if control pressure too high).
  Eliminate restriction.

- Warm-up regulator defective. Replace warm-up regulator.

When the warm-up regulator has been replaced or a fault remedied, carry out the idle adjustment with the engine at normal operating temperature.

Idle adjustment is described on Coordinate F 5.



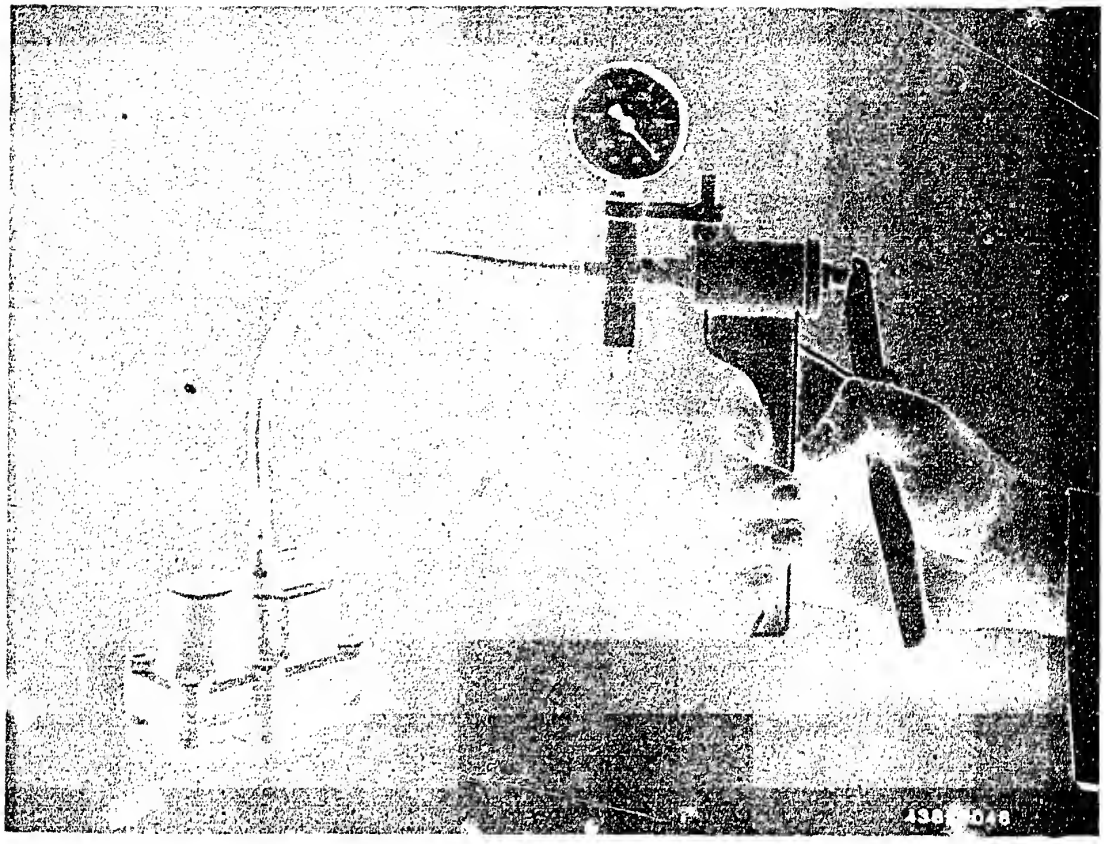
a = To warm-up regulator
b = To pressure gauge
c = From fuel distributor

14.7 Checking the "warm" control pressure

Warm-up regulator Part No.: 0 438 140 038

The test is performed with the engine switched off, once without intake-manifold pressure being applied, once with simulated intake-manifold pressure (vacuum) applied.

Open the valve screw of the directional-control valve (or both valves in the case of KDEP 1034).



- Warm-up regulator Part No. 0 438 140 038

For testing with simulated intake-manifold pressure, connect the vacuum pump to the intake-manifold-pressure connection port of the warm-up regulator (on top of the housing, next to the plug housing).

The picture shows the recommended Mityvac hand pump.

Setting value for the test: 510...550 mbar
(385...415 mmHg)

Test procedure:

The temperature of the engine is not important.
Open the valve screw of the directional-control valve (both in the case of KDEP 1034).
Switch on the electric fuel pump by bridging the electrical safety circuit.

Plug the plug onto the warm-up regulator.
The control pressure increases (warm-up regulator in the process of shutting off) until the "warm" control pressure is reached.

Test first of all without the application of intake-manifold pressure, then test with simulated intake-manifold pressure (vacuum) in accordance with the values given below:

Test step	Test specifications*
"Warm" control pressure Part No. of warm-up regulator: 0 438 140 038	
• Test with atmospheric pressure (without vacuum)	3,0...3,4 bar (2.8...3.2 kgf/cm²)
• For testing, connect vacuum pump to intake-manifold-pressure connection of warm-up regulator. Setting value: 510...550 mbar (385...415 mmHg)	3.4...3.8 bar (3.5...3.9 kgf/cm²)

*Pressures in the test-specification table are given in bar (gauge pressure) and/or in kgf/cm² (gauge pressure).

If the measured "warm" control pressure differs from the test specification, this may be due to one of the following faults:

If control pressure too high:

- Fuel delivery for the control-pressure circuit too high.
  Test fuel delivery.
  Test specification: 160...240 cm^3/min.

- Fuel return from the warm-up regulator blocked or constricted. Eliminate constriction.

- Warm-up regulator has hydraulic defect.
  Replace warm-up regulator.

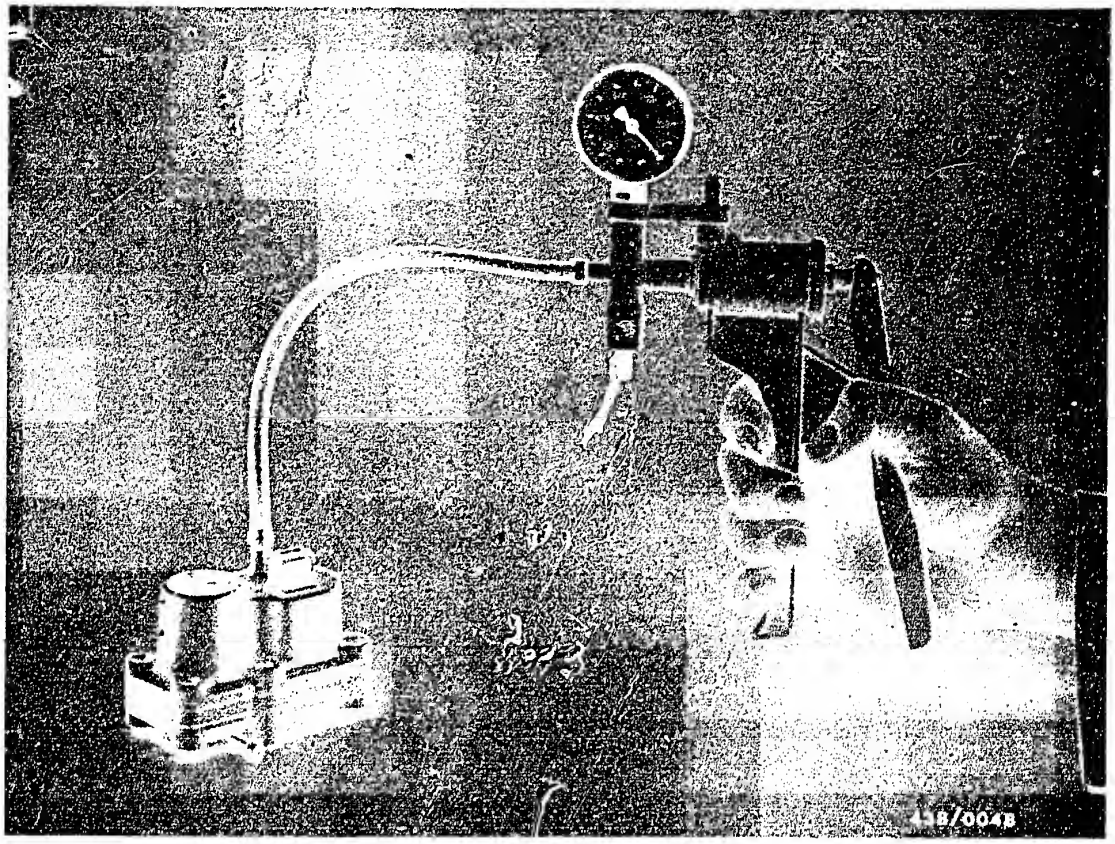
If control pressure too low:

- Power supply open-circuit.
  Eliminate open circuit. Ensure that the plug is contacting properly.

- Battery voltage too low, voltage drop.
  Eliminate voltage drop. Minimum voltage at connector: 11.5 V.
  If necessary, repeat test with engine running in order to obtain the normal generator voltage of approx. 14 V when the vehicle is in operation.

- Fuel delivery for the control-pressure circuit too low.
  Test fuel delivery.
  Test specification: 160...240 cm^3/min.

- Warm-up regulator defective. Heating coil open-circuit. Hydraulic defect. Replace warm-up regulator.



- Testing the full-load diaphragm for leaks on warm-up regulator 0 438 140 038

Switch off the electric fuel pump.
Connect the "Mityvac" hand vacuum pump to the intake-manifold-pressure connection port of the warm-up regulator and build up a vacuum.

Setting value: 510...550 mbar (385...415 mmHg).

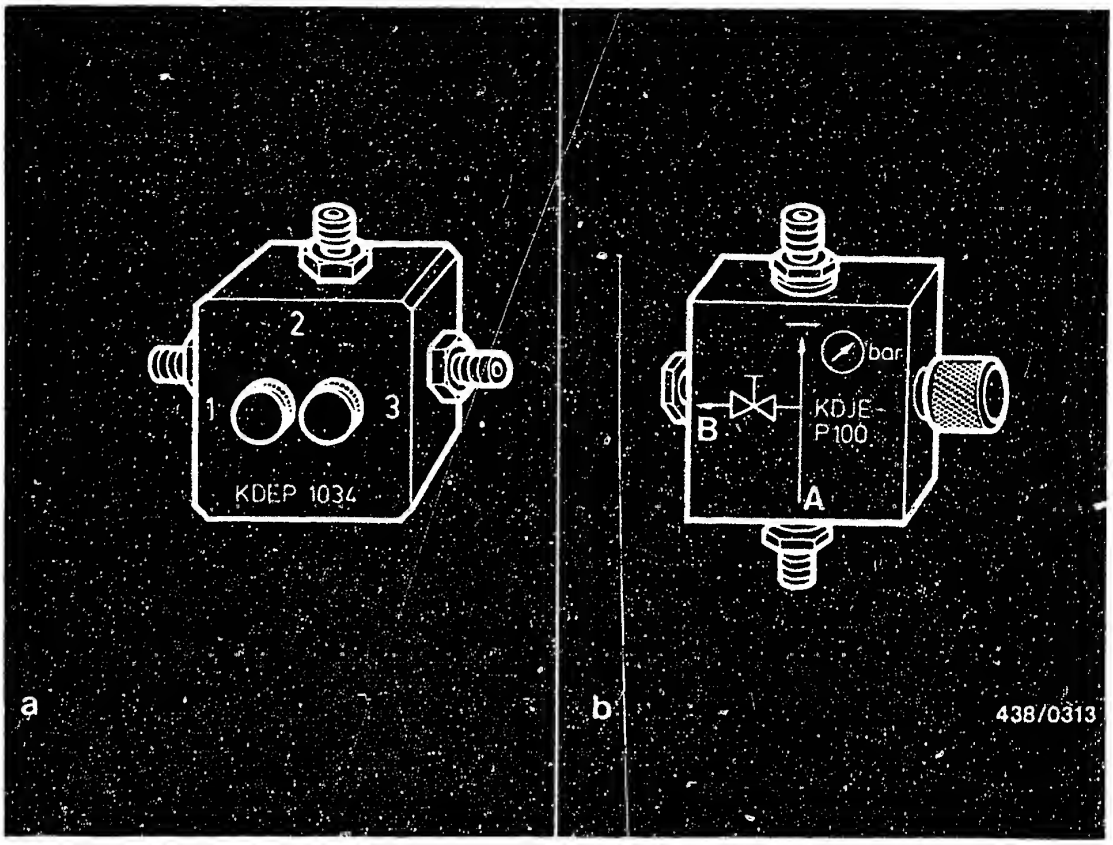
Max. pressure drop within 15 s 100 mbar (75 mmHg).
If the pressure drop is too great, replace the warm-up regulator.

Note:

Incorrect control-pressure functions during vehicle operation may also be due to a malfunction in the intake-manifold pressure control system for the warm-up regulator. Therefore, check the condition and correct fitting of the connecting hose from the intake manifold to the warm-up regulator. Check the system with the engine running and when warmed-up. This test is best combined with the final idle adjustment.

When the warm-up regulator has been replaced or a fault remedied, carry out the idle adjustment with the engine at normal operating temperature.

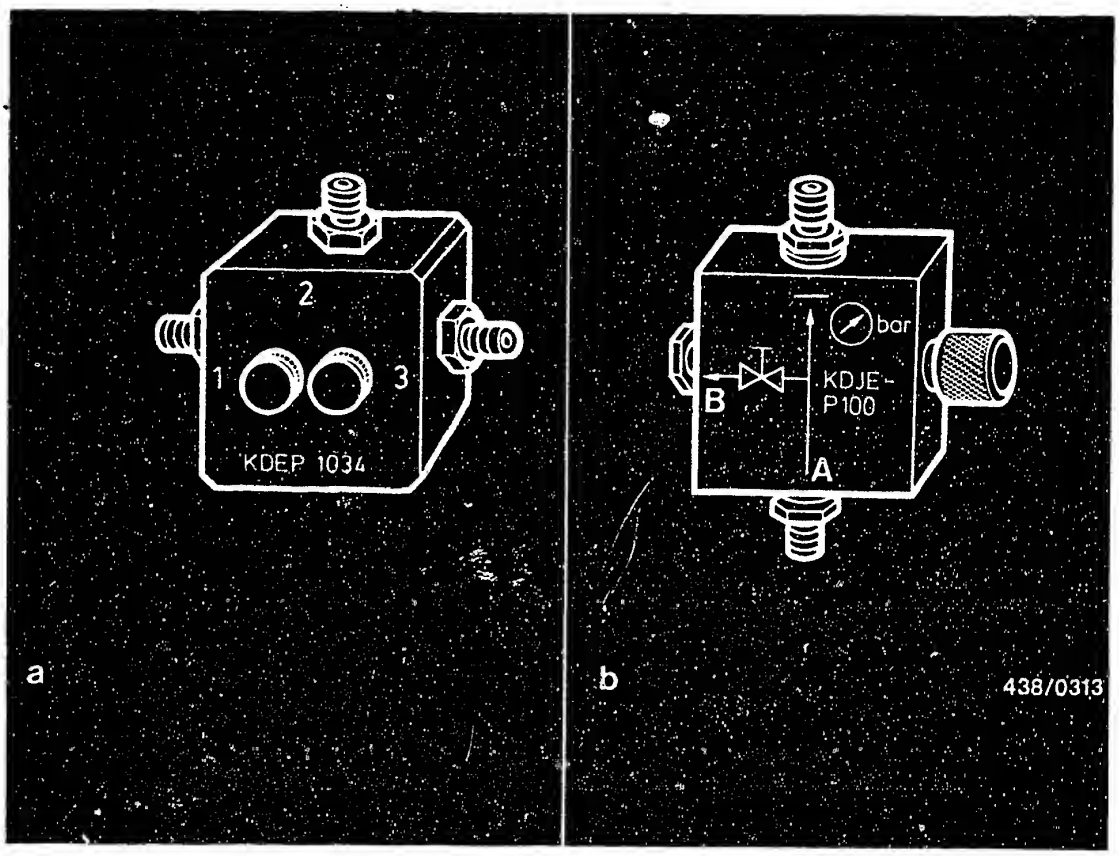
Idle adjustment is described on Coordinate F 5.



15. Testing and adjusting the primary (system) pressure:

15.1 Mounting the pressure tester KDJE-P 100 (formerly KDEP 1034):

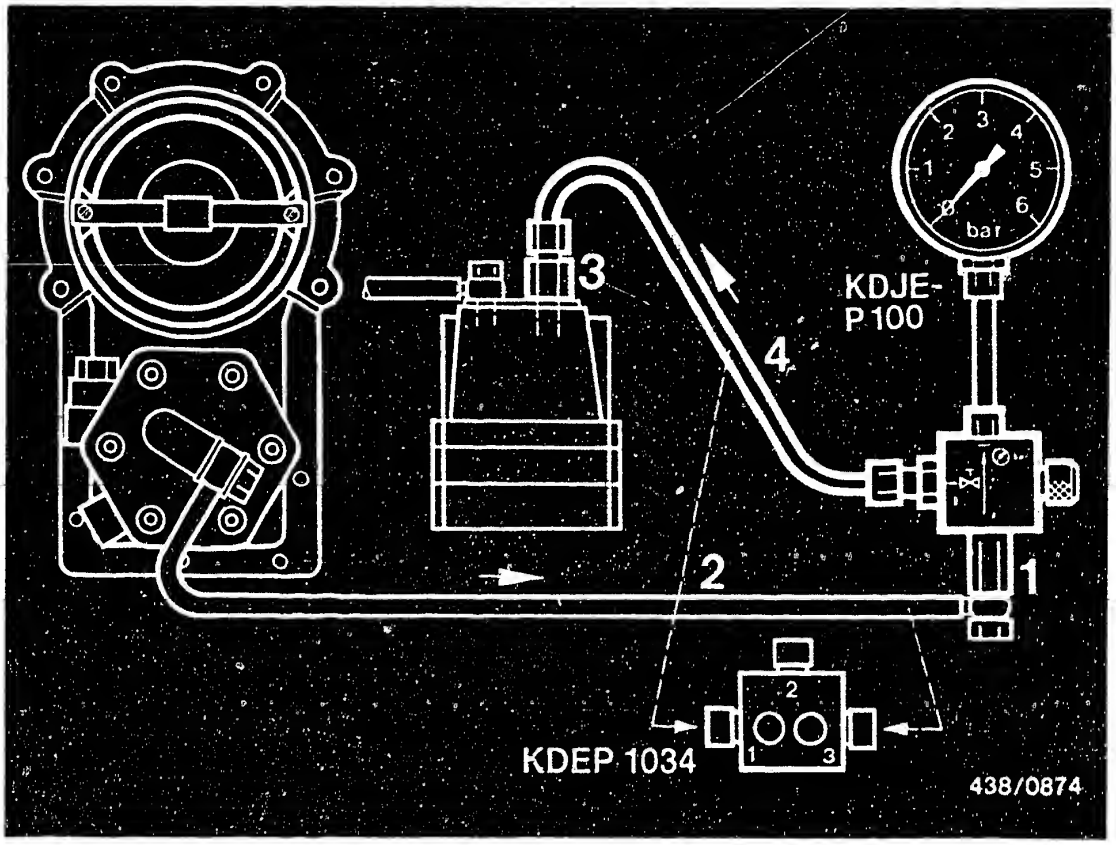
The pressure tester KDEP 1034 is equipped with a three-way valve with 2 separate valve screws. The connections of the directional-control valve are numbered (Fig. a).



Since the end of 1979 the pressure tester KDJE-P 100 has been supplied. Its directional-control valve has only one valve screw (Fig. b). The connections of this directional-control valve are identified by symbols:

A = Inlet (from the fuel distributor)
B = Outlet (to the warm-up regulator)

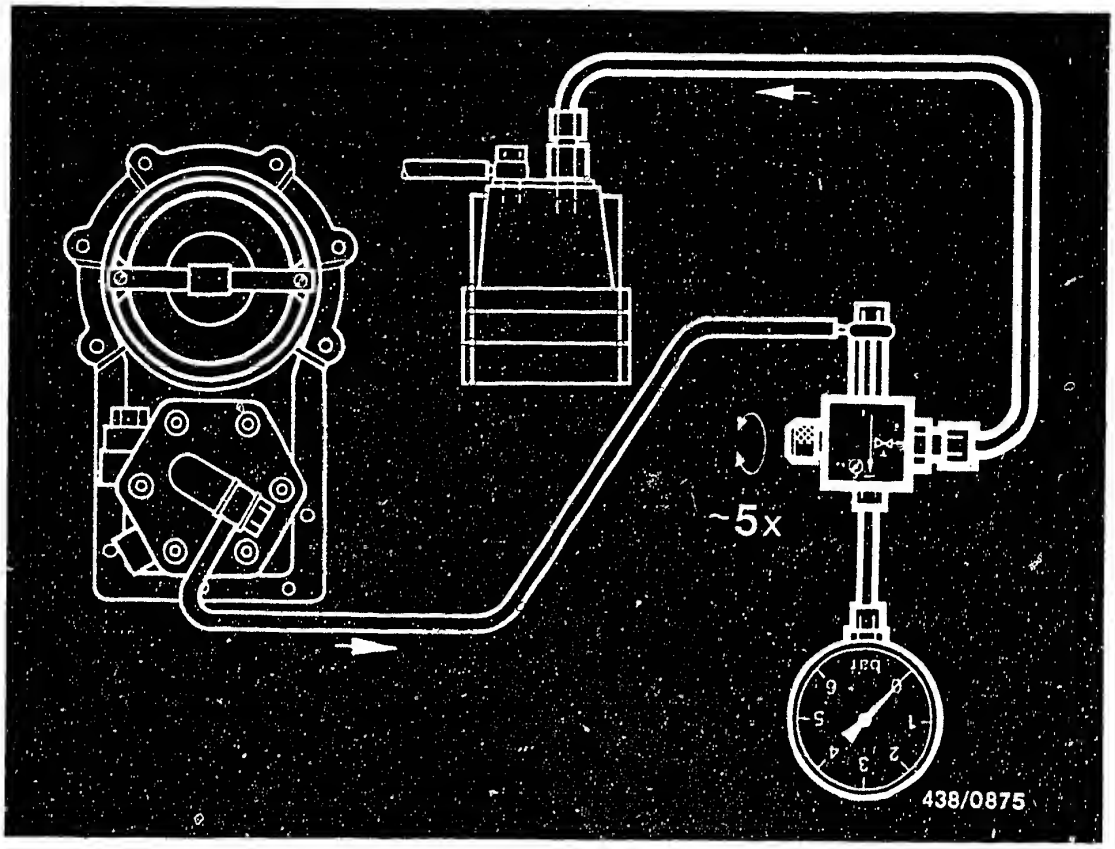
Caution:
When the directional-control valve is not in use, always keep the valve screw(s) open in order to relieve the pressure on the seal rings.



The directional-control valve of the pressure tester is connected into the control-pressure line from the fuel distributor to the warm-up regulator.
Fit using connecting-parts set KDJE-P 100/12.

Screw the adapter (1) with seal onto inlet fitting A or 3 of the directional-control valve.
Unscrew the control-pressure line (2) on the warm-up regulator and connect with inlet-union screw M 10 x 1 and seal rings to the adapter (1).
Screw connecting piece (3) of connecting-parts set into inlet of warm-up regulator and, using hose line (4), connect to outlet fitting B or 1 of the directional-control valve.

Suspend the pressure gauge from the engine hood (possibly using a wire hook).



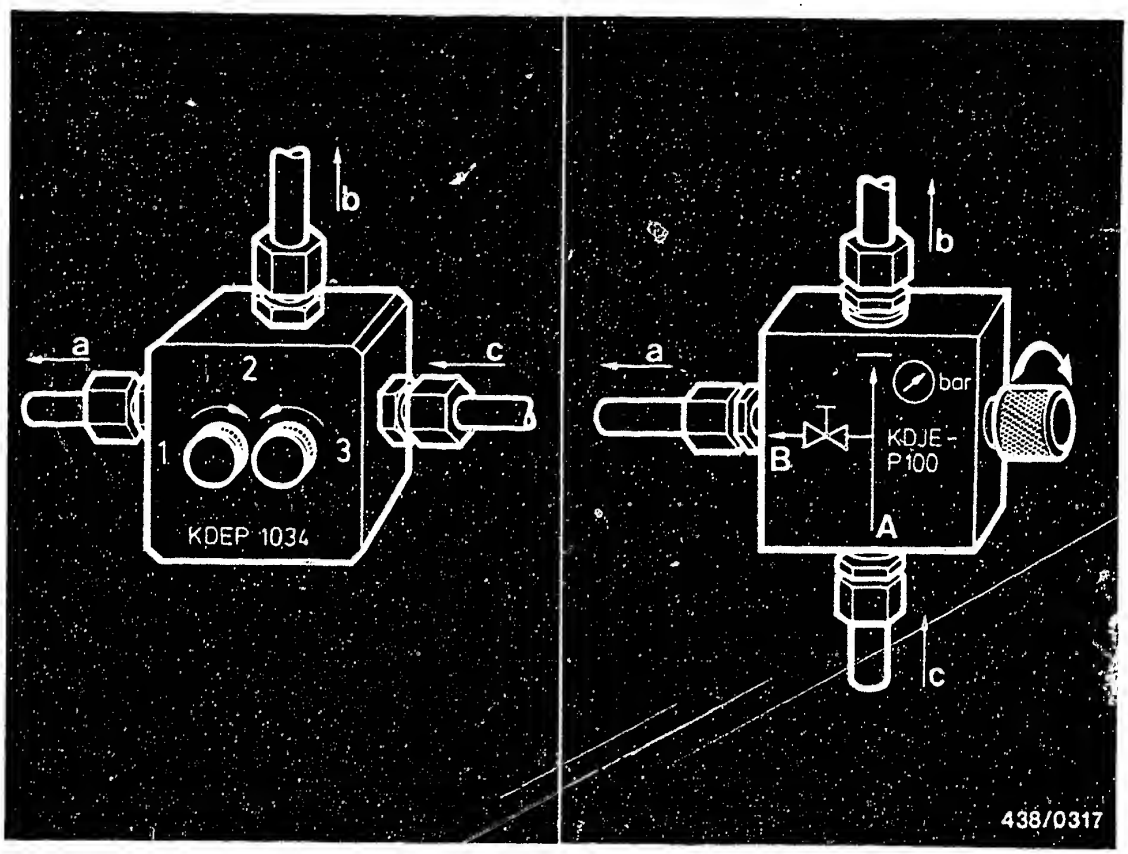
15.2 Bleeding the pressure tester

Disconnect the electric plug from the warm-up regulator. Let the pressure gauge hang down (hose fully extended).

Switch on the electric fuel pump by bridging the electrical safety circuit.

Open and close the valve screw(s) of the directional-control valve in a 10-second rhythm about 5 times.

Then hang the pressure gauge from a suitable support (e.g. from one of the struts under the engine hood). Open valve screw of directional-control valve (both screws in the case of KDEP 1034) (turning to the left).



a = To warm-up regulator
b = To pressure gauge
c = From fuel distributor

15.3 Testing the primary pressure:

The test is performed with the engine switched off. The temperature of the engine is not important.

Close the valve screw of directional-control valve KDJE-P 100. In the case of KDEP 1034, close valve screw 1, open valve screw 3.

Switch on the electric fuel pump by bridging the electrical safety circuit.

The pressure gauge now indicates the primary pressure.

Fuel distributor Part No.	Test specifications - primary pressure (gauge pressure)
0 438 100 081	4.5...5.2 bar (4.6...5.3 kgf/cm²)
0 438 100 092	4.7...5.4 bar (4.8...5.5 kgf/cm²)

Possible causes for too low a primary pressure:

- Fuel supply faulty
(Delivery of electric fuel pump too low).

- Primary pressure set incorrectly.

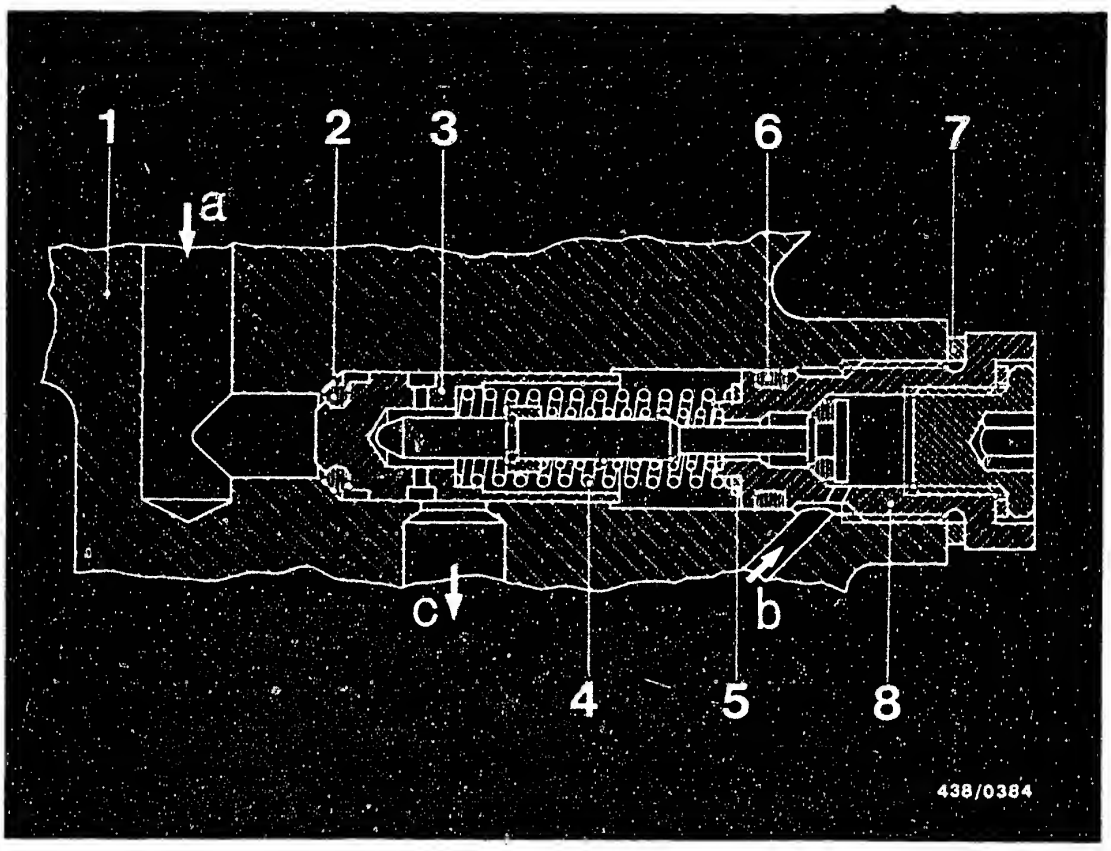
A precondition for readjustment of the primary pressure is always that the fuel supply is in order.
Measure the fuel delivery. (Test specification: 950 cm³/30 s.

Possible causes for too high a primary pressure:

- A restriction in the return line leading to the fuel tank.

- Primary-pressure regulator set incorrectly.

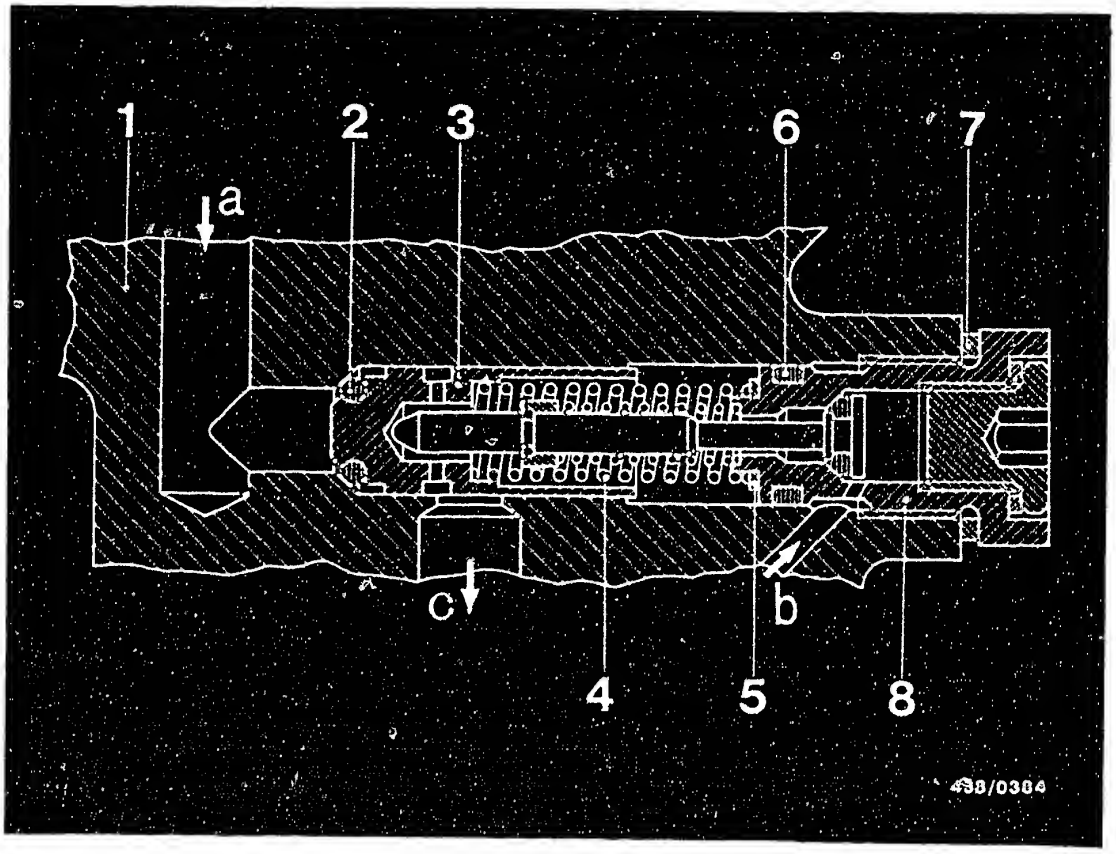
For this reason, before readjusting too high a primary pressure, always first check the condition of the return line leading to the fuel tank.



a = Primary pressure
b = From warm-up regulator
c = Fuel return
1 = Fuel-distributor housing
2 = O-ring.
3 = Control piston
4 = Control spring
5 = Shim(s)
6 = O-ring
7 = Flat seal ring
8 = Screw plug

15.4 Adjusting the primary pressure:

Fuel distributor Part No.	Adjustment values - primary pressure (gauge pressure)
0 438 100 081	4,7...4,9 bar (4,8...5,0 kgf/cm^2)
0 438 100 092	4,9...5,1 bar (5,0...5,2 kgf/cm^2)

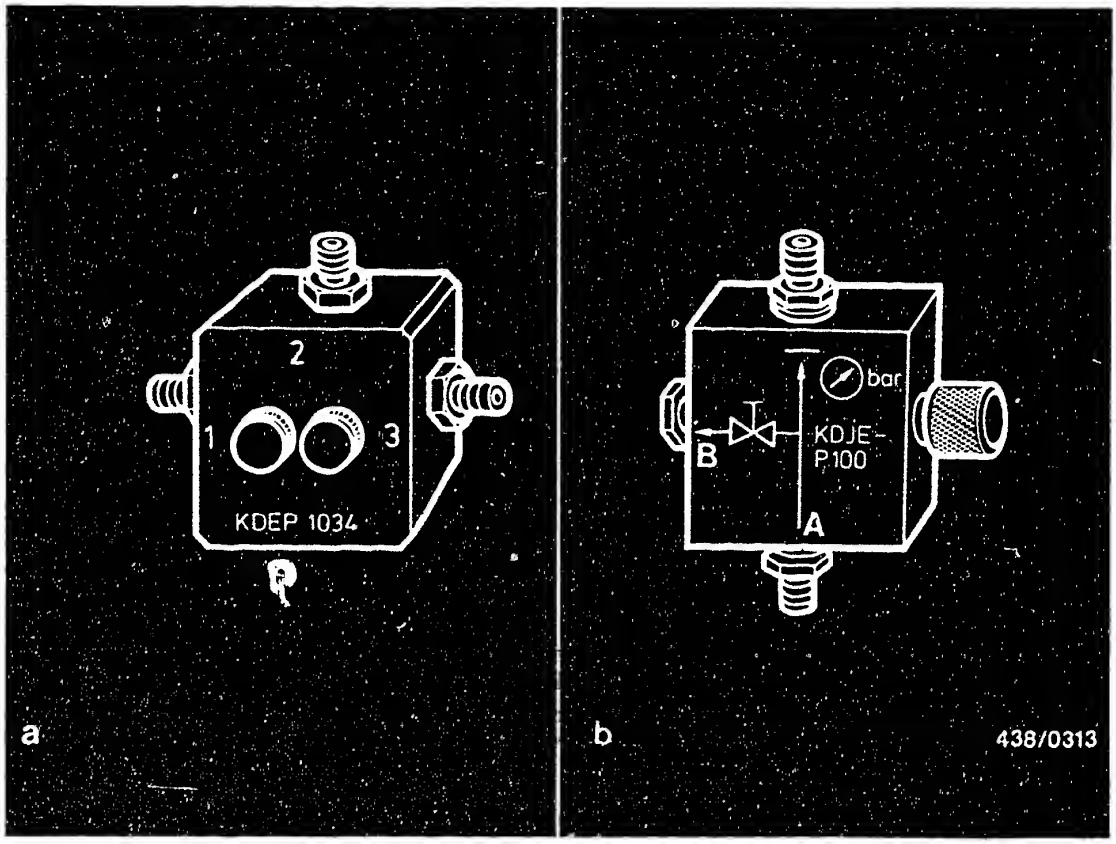


The primary pressure is readjusted by replacing the shims (Item 5).

Note:
0.1 mm more of shim thickness means about 0.15 bar pressure increase and vice versa.

To do this, screw out the large screw plug (Item 8) together with the push valve. After carrying out the adjustment, always fit the screw plug with a new flat seal ring (Item 7) and O-ring (Item 6).

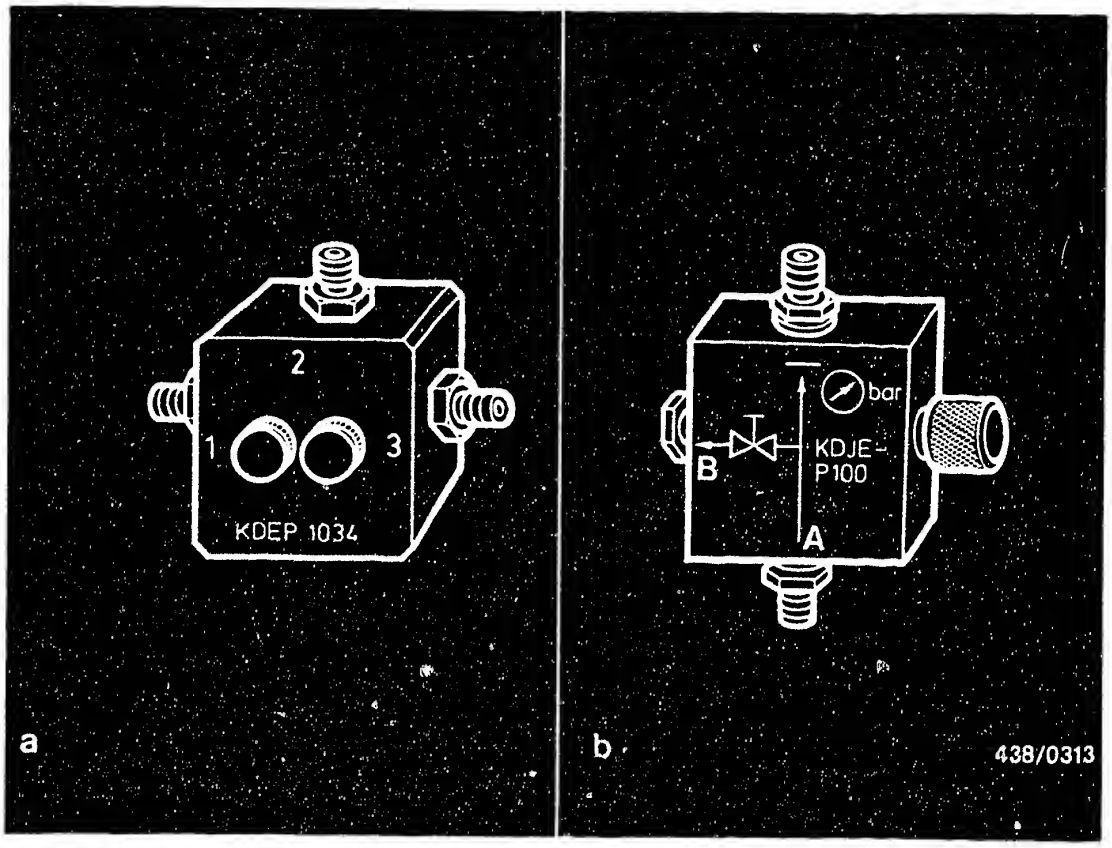
The control piston (Item 3) of the primary-pressure regulator must not be lost. It was matched specially to the fuel distributor housing in the manufacturing plant and therefore is the only part of the primary-pressure regulator which must not be replaced.



16. Testing the entire fuel system for leaks.

16.1 Mounting the pressure tester KDJE-P 100 (formerly KDEP 1034):

The pressure tester KDEP 1034 is equipped with a three-way valve with 2 separate valve screws. The connections of the directional-control valve are numbered (Fig. a).

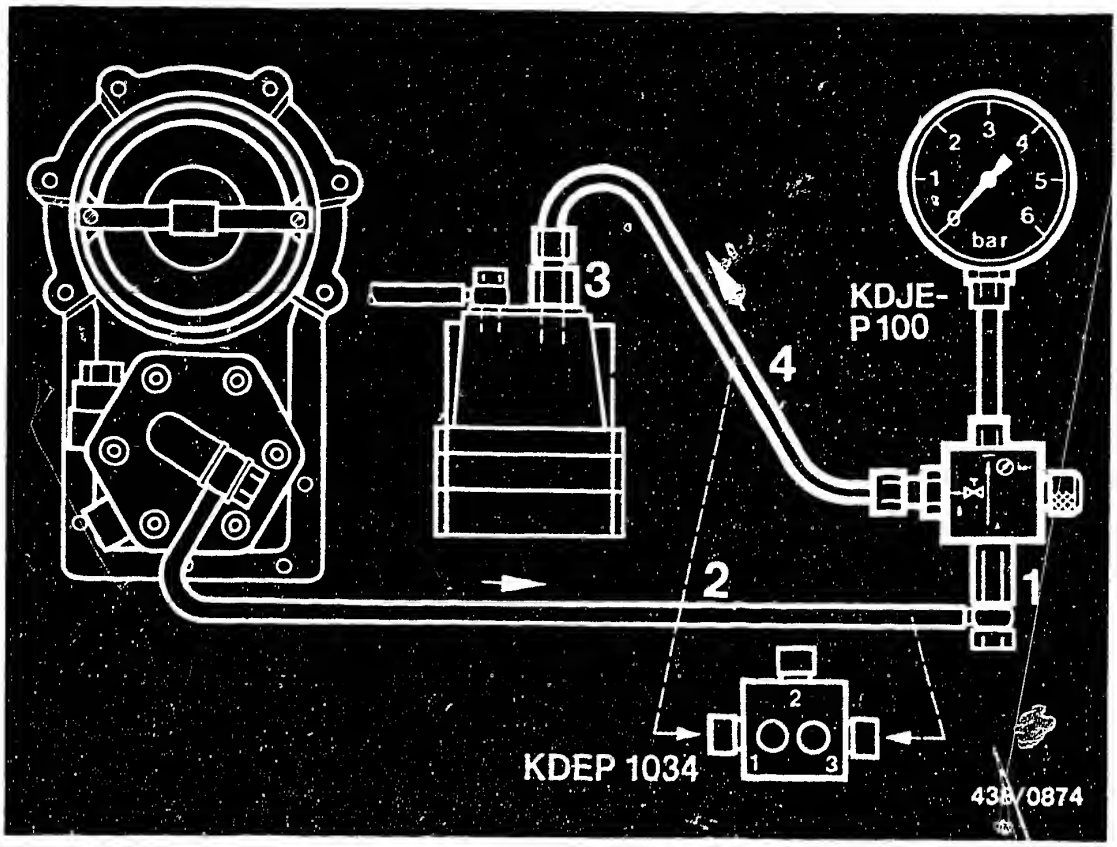


Since the end of 1979 the pressure tester KDJE-P 100 has been supplied. Its directional-control valve has only one valve screw (Fig. b). The connections of this directional-control valve are identified by symbols:

A = Inlet (from the fuel distributor)
B = Outlet (to the warm-up regulator)

Caution:

When the directional-control valve is not in use, always keep the valve screw(s) open in order to relieve the pressure on the seal rings.



The directional-control valve of the pressure tester is connected into the control-pressure line from the fuel distributor to the warm-up regulator.

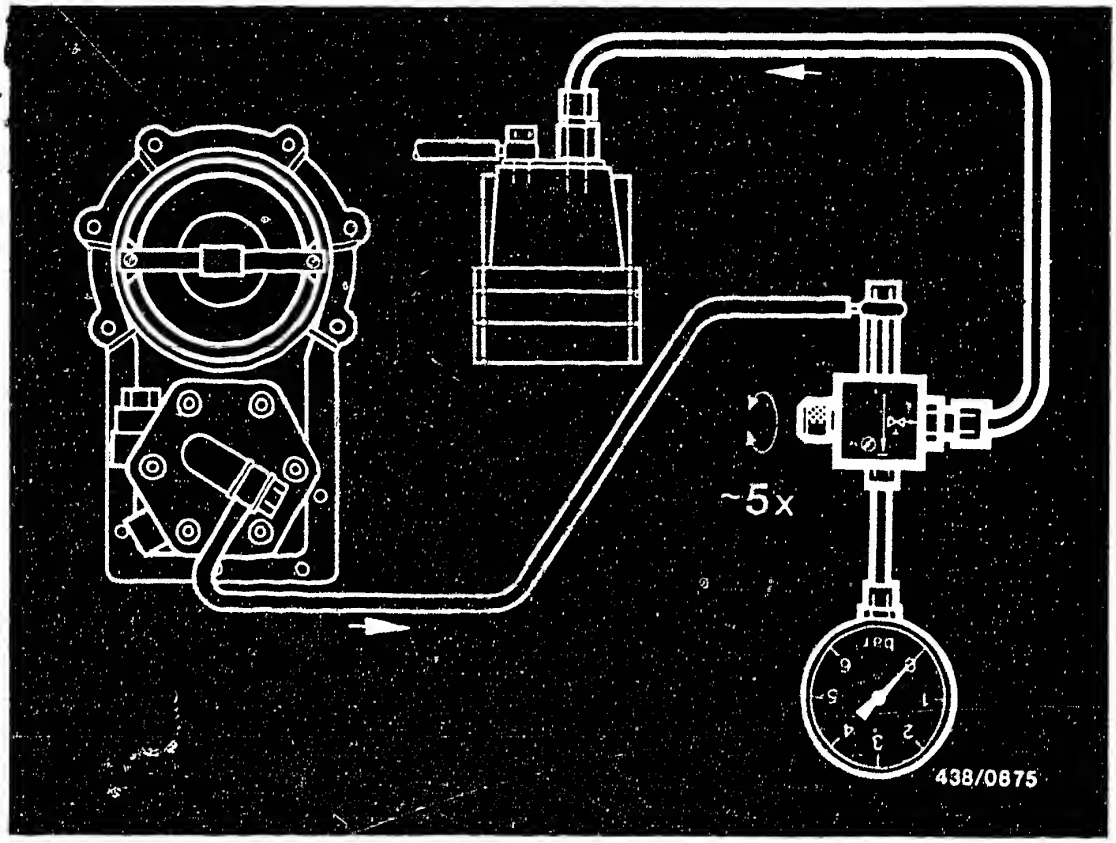
Fit using connecting-parts set KDJE-P 100/12.

Screw the adapter (1) with seal onto inlet fitting A or 3 of the directional-control valve.

Unscrew the control-pressure line (2) on the warm-up regulator and connect with inlet-union screw M 10 x 1 and seal rings to the adapter (1).

Screw connecting piece (3) of connecting-parts set into inlet of warm-up regulator and, using hose line (4), connect to outlet fitting B or 1 of the directional-control valve.

Suspend the pressure gauge from the engine hood (possibly using a wire hook).



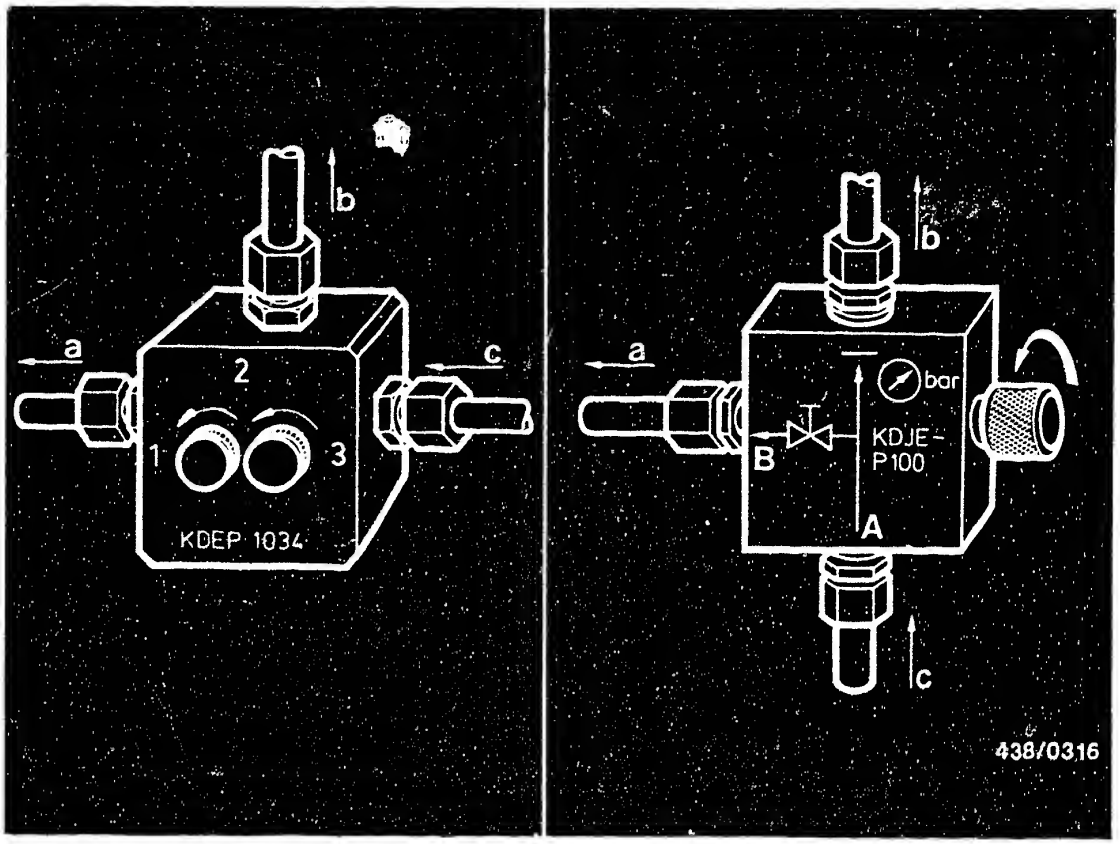
16.2 Bleeding the pressure tester

Disconnect the electric plug from the warm-up regulator. Let the pressure gauge hang down (hose fully extended).

Switch on the electric fuel pump by bridging the electrical safety circuit.

Open and close the valve screw(s) of the directional-control valve in a 10-second rhythm about 5 times.

Then hang the pressure gauge from a suitable support (e.g. from one of the struts under the engine hood). Open valve screw of directional-control valve (both screws in the case of KDEP 1034) (turning to the left).



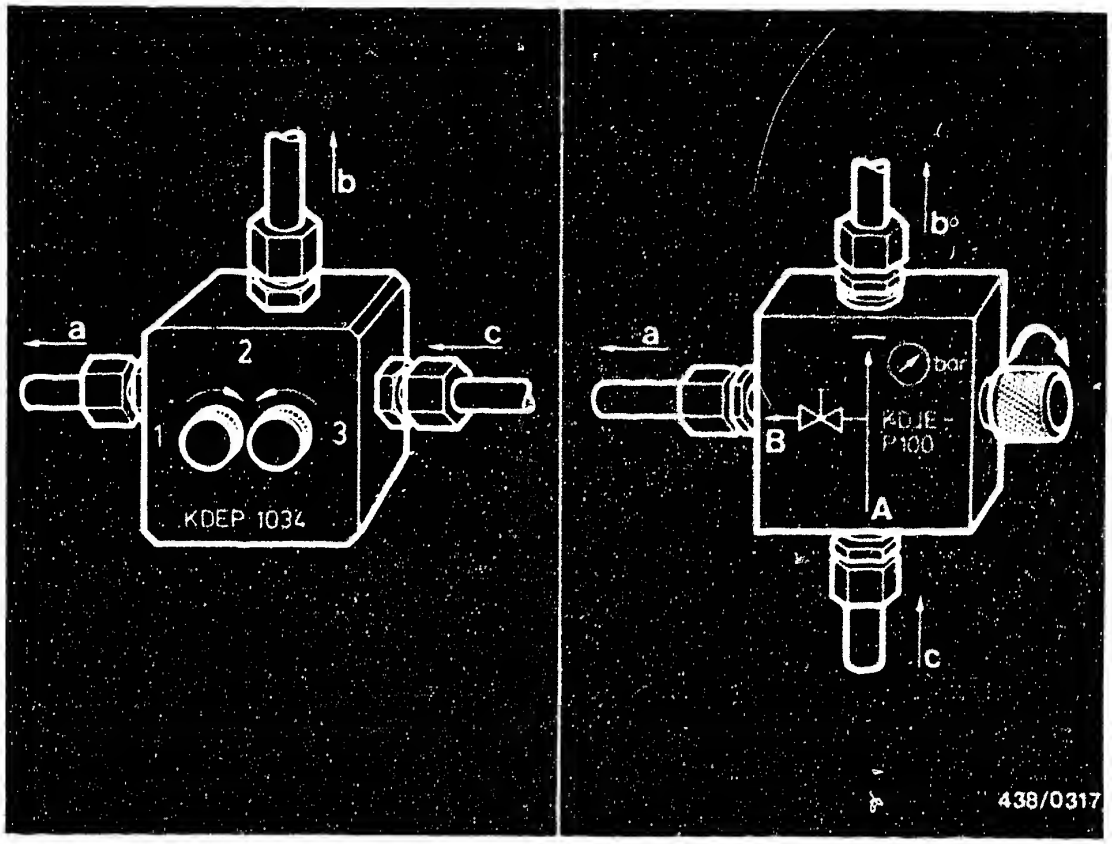
a = To warm-up regulator
b = To pressure gauge
c = From fuel distributor

16.3 Leak test

The test is performed with the engine switched off. Make the test with a warm engine but not immediately after the engine has been operated at a high temperature.
Open the valve screw of the directional-control valve (both valves in the case of KDEP 1034).

Switch on the electric fuel pump by bridging the electrical safety circuit until the warm-up regulator has ceased to operate ("warm" control pressure).
Switch the electric fuel pump off again and observe the drop in pressure on the pressure gauge.

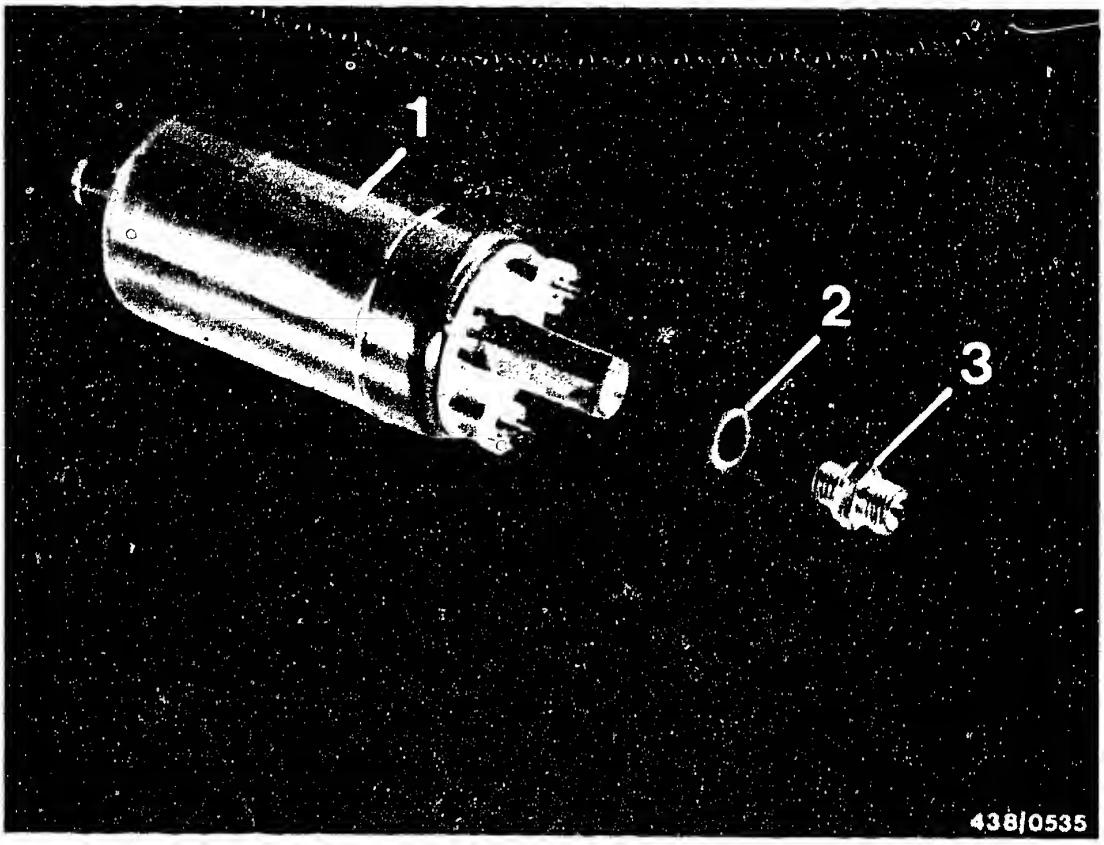
Test specifications for leak test:	fuel accumulator	
	0 438 170 014 (1978/79 models)	0 438 170 029 (from 1980 model)
Minimum pressure (gauge pressure) after		
10 minutes:	1,6 bar (1,7 kgf/cm²)	2.7 bar (2.8 kgf/cm²)
20 minutes:	1,4 bar (1,5 kgf/cm²)	2.6 bar (2.7 kgf/cm²)



a = To warm-up regulator
b = To pressure gauge
c = From fuel distributor

If the pressure drops too quickly, repeat the test with the control-pressure circuit disconnected.

Position of the valve screws:
Close the valve screw of the directional-control valve KDJE-P 100.
In the case of KDEP 1034, close valve screw 1, open valve screw 2.
If the same result is found, the leak is in the primary-pressure circuit.
If the test results are correct during the second test, the leak is in the control-pressure circuit.



1 = Electric fuel pump
2 = Flat seal ring
3 = Tube fitting

16.4 Possible causes of a defect in the primary-pressure circuit:

- Non-return valve in the pressure connection piece of the electric fuel pump has a leak.

Electric fuel pump 0 580 254 984
The non-return valve is permanently installed in the pressure connection piece and cannot be replaced.
In order to avoid having to change the complete electric fuel pump when the non-return valve has a leak, a parts set with a separate non-return valve has been introduced and can be used on the above-mentioned electric fuel pump.
Part number of the parts set: 1 687 010 004.

Contents of parts set 1 587 010 004:

1 Tube fitting with built-in non-return valve
1 Seal ring

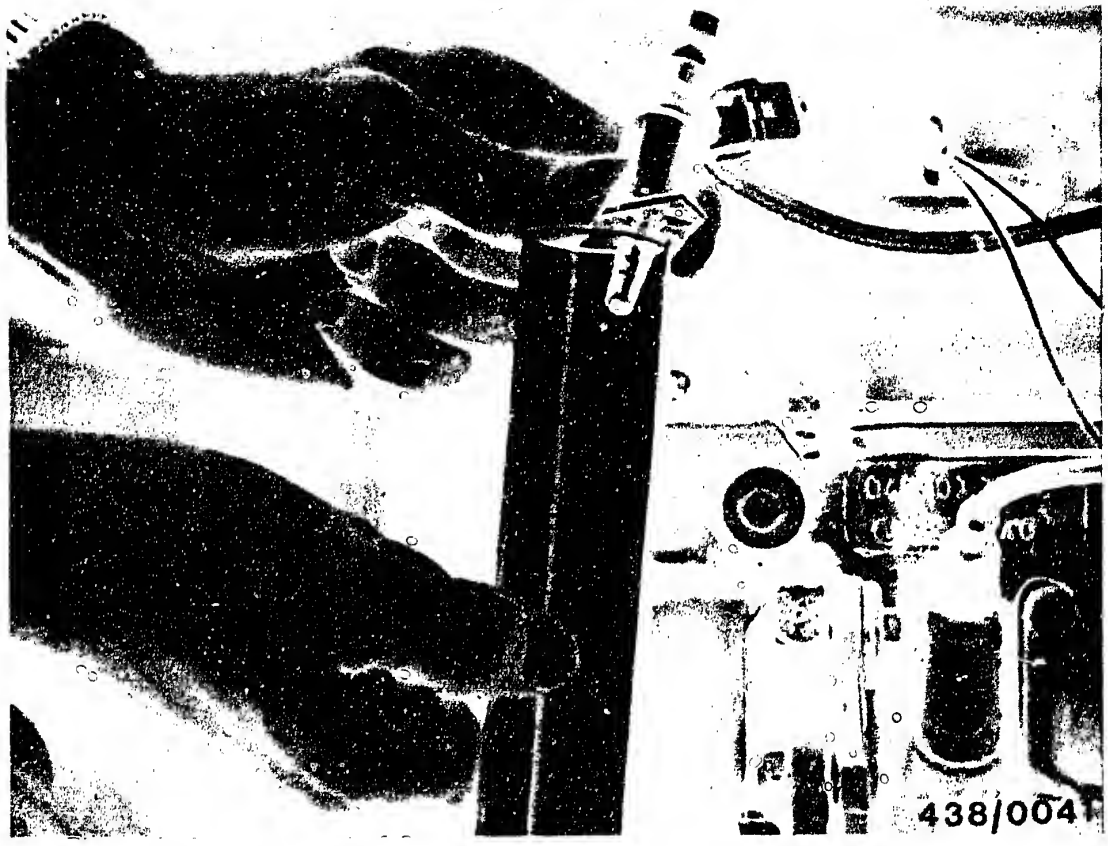
Installation:
Thoroughly clean the connection of the delivery line on the electric fuel pump.
Pinch off the intake hose (fuel tank - electric fuel pump) (e.g. using hose clamper W 175 from Matra Co.).
Screw off the delivery line, collecting any escaping fuel. Unscrew the double threaded connector out of the pressure connection piece.
The defective original non-return valve remains in the electric fuel pump.

Screw the tube fitting of the parts set (M 12x1.5) with a thick flat seal ring into the pressure connection piece and tighten to a torque of 17...25 Nm while at the same time applying a wrench to the hexagonal section of the pressure connection piece.

Connect the fuel delivery line.

Remove the hose clamper from the intake hose.

Check connections for leaks with the electric fuel pump in operation.



● Start valve has a leak

Remove the start valve for testing; the fuel line remains connected. As of the 1981 model, replace the steel fuel line by a flexible hose line for testing (e.g. hose of the pressure tester). Hold the start valve in a suitable container (e.g. graduate).

Switch on the electric fuel pump by bridging the electrical safety circuit.

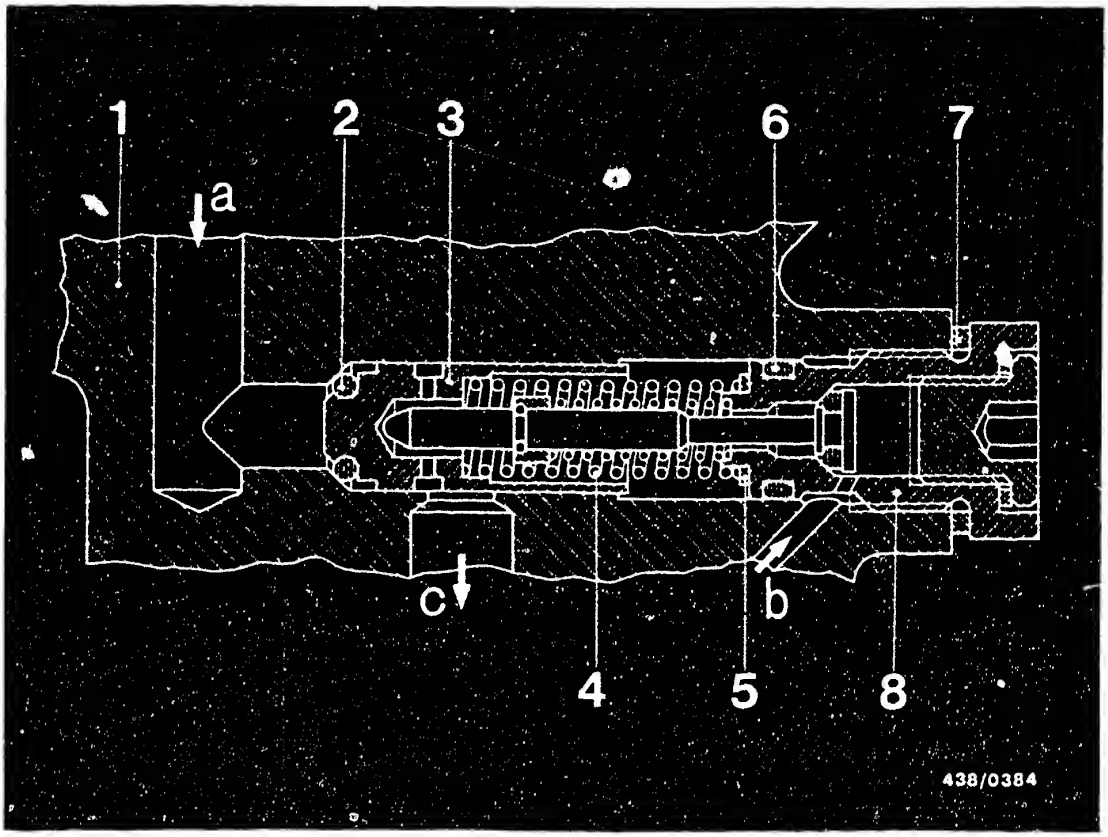
Dry off the nozzle of the start valve.

No drops must fall from the nozzle of the start valve within the next minute. Even when shaken and knocked, the start valve must not leak.

Then switch the electric fuel pump off again.

Replace the start valve if leaking.

Finally, carry out the idle adjustment with the engine at normal operating temperature. See Coordinate F 5.



a = Primary pressure
b = From warm-up regulator
c = Fuel return
1 = Fuel-distributor housing
2 = O-ring
3 = Control piston
4 = Control spring
5 = Shim(s)
6 = O-ring
7 = Flat seal ring
8 = Screw plug

- Seal ring (O-ring) on control piston of primary-pressure regulator has a leak.

Replace the seal ring.
Clean the fuel distributor in the region of the primary-pressure regulator.

Unscrew the large screw plug (8) with the complete push-up valve. Also remove the shims (5), control spring (4) and control plunger (3).

Replace the seal ring (O-ring) (2) on the control plunger. Install the control plunger and the control spring.

Screw in the screw plug with the complete push-up valve and with shims (as found when removing) and new seal rings (6 and 7).

Finally, check the primary pressure and, if necessary, adjust by changing the shims (5).

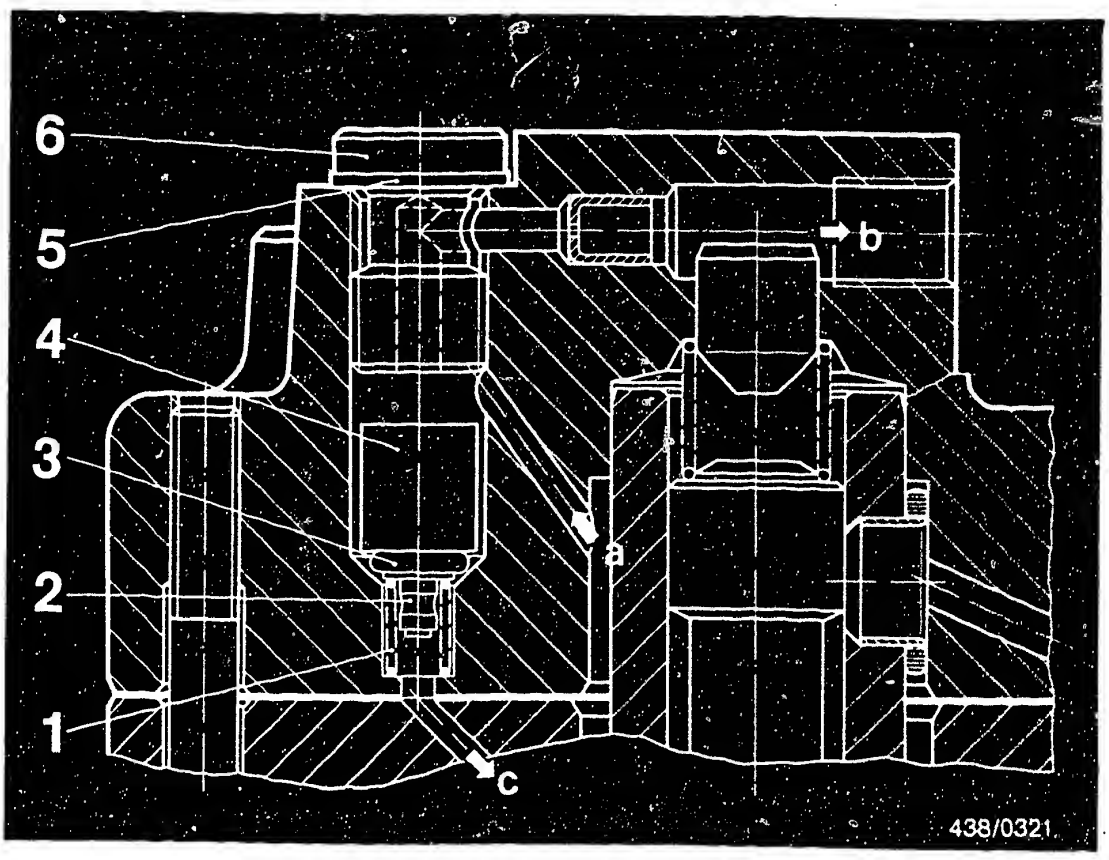
Primary pressure:

Fuel distributor 0 438 100 081
(1979/1980 models)

Checking value: 4.5...5.2 bar (4.6...5.3 kgf/cm^2)
Setting value : 4.7...4.9 bar (4.8...5.0 kgf/cm^2)

Fuel distributor 0 438 100 092
(as from 1980 model)

Checking value: 4.7...5.4 bar (4.8...5.5 kgf/cm^2)
Setting value : 4.9...5.1 bar (5.0...5.2 kgf/cm^2)

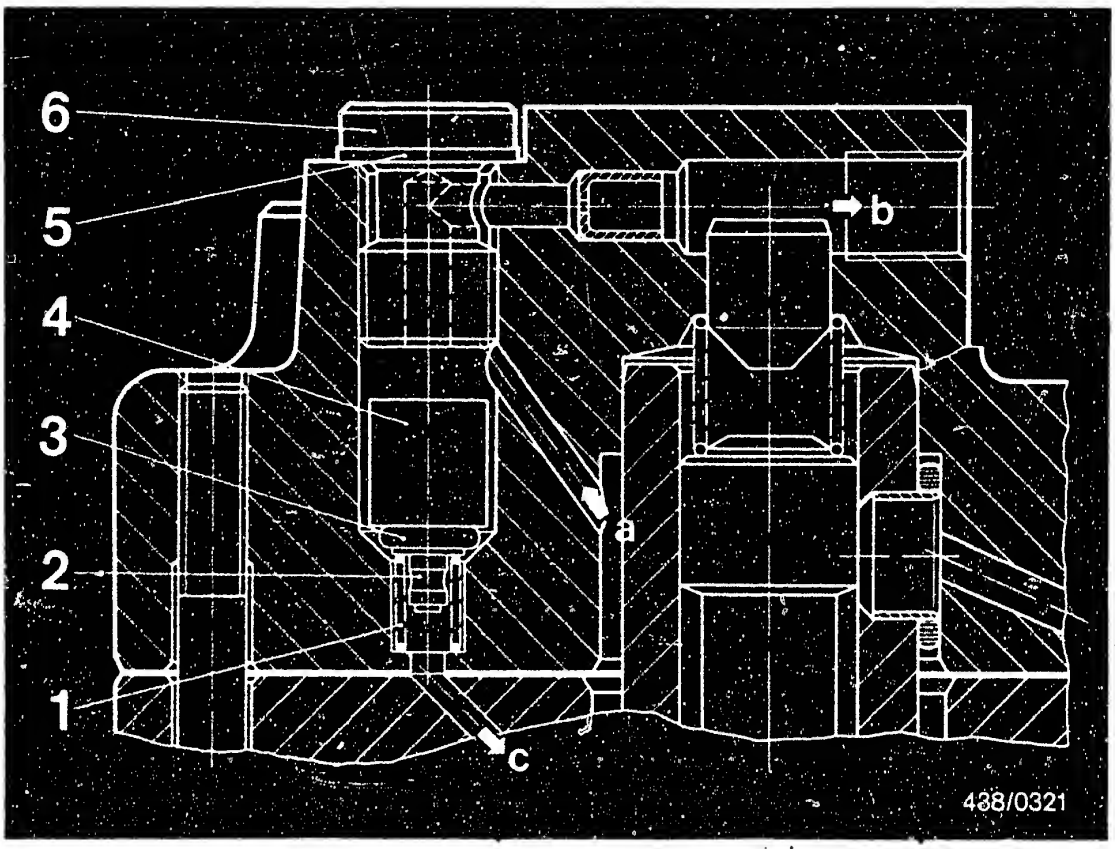


a = Primary pressure
b = Control pressure (to warm-up regulator)
c = Fuel return
1 = Valve spring
2 = Retaining ring
3 = Shaped seal ring
4 = Valve piston
5 = Flat seal ring
6 = Screw plug

- Pressure-relief valve on control-pressure dome of fuel distributor leaking.
  Concerns only fuel distributor 0 438 100 092

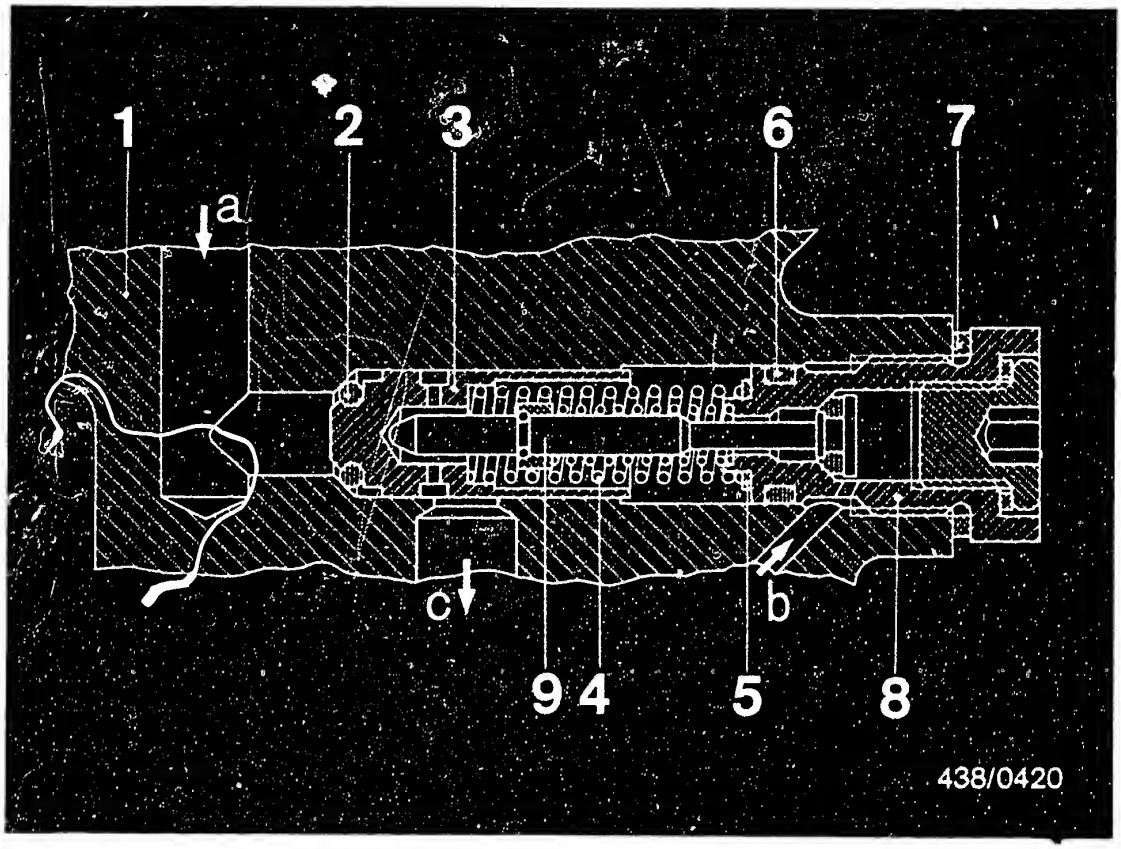
Replace the complete pressure-relief valve.

The parts set contains all items 1 to 6.



a = Primary pressure
b = Control pressure (to warm-up regulator)
c = Fuel return
1 = Valve spring
2 = Retaining ring
3 = Shaped seal ring
4 = Valve piston
5 = Flat seal ring
6 = Screw plug

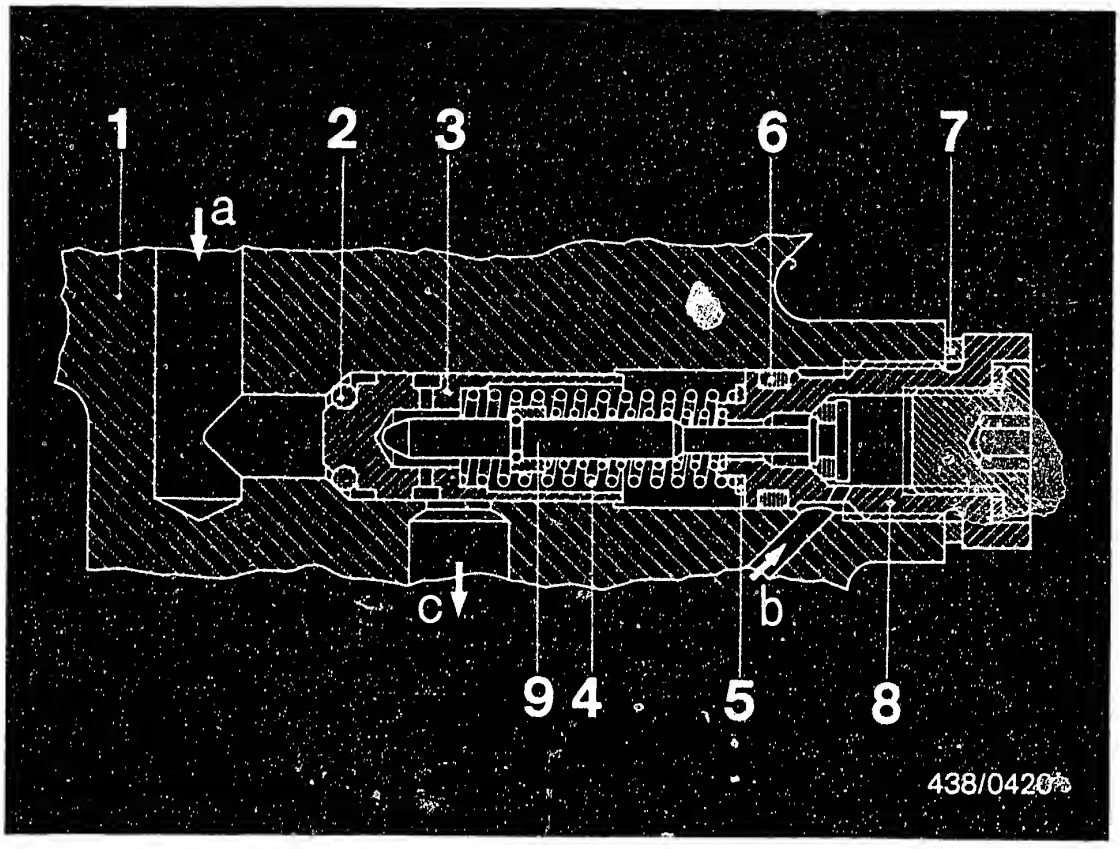
Clean the fuel distributor in the area of the control-pressure dome. Unscrew screw plug with 13 mm box wrench or, in the case of the previous version, using Torx off-set wrench size TX 730 (commercially available).
Remove the valve piston and valve spring.
Assembling the parts set:
Insert valve spring and partially assembled valve piston of parts set and seal bore with flat seal ring and screw plug.



a = Primary pressure
b = From warm-up regulator
c = Fuel return
1 = Fuel-distributor housing
2 = O-ring
3 = Control piston
4 = Control spring
5 = Shim(s)
6 = O-ring
7 = Flat seal ring
8 = Screw plug
9 = Push valve

16.5 Possible causes of a defect in the control-pressure circuit

- The push valve (9) in the primary-pressure regulator has a leak. Since the seal ring of the push valve is rigidly vulcanized onto the valve needle, the whole push valve (ready-assembled unit) must be changed.

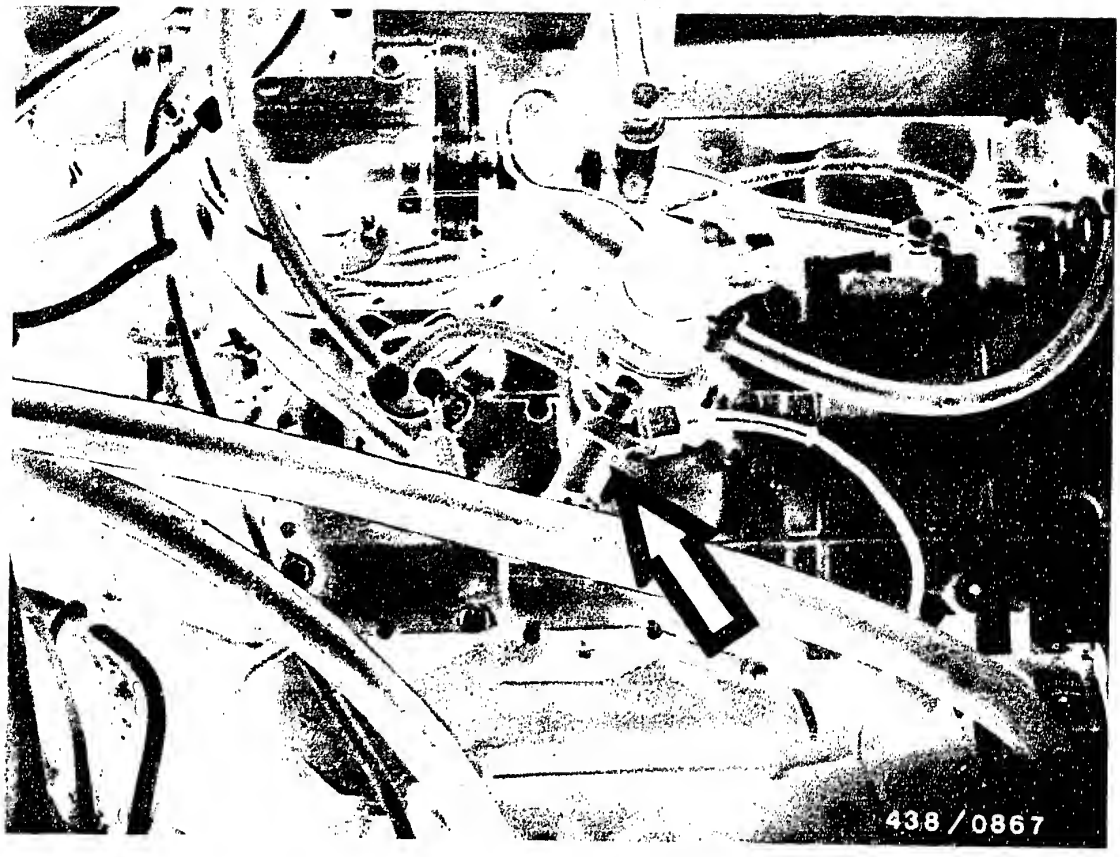


a = Primary pressure
b = From warm-up regulator
c = Fuel return
1 = Fuel distributor housing
2 = O-ring
3 = Control piston
4 = Control spring
5 = Shim(s)
6 = O-ring
7 = Flat seal ring
8 = Screw plug
9 = Push valve

Clean the fuel distributor in the region of the primary-pressure regulator. Screw out the large screw plug (8) together with the complete push valve. Pay attention to control spring (4) and shims (5).
Screw in new push valve using the number of shims (5) as when removed, new O-ring (6) and flat seal ring (7).
Finally, check the primary pressure and, if necessary, adjust by changing the shims (5).

Primary pressure, test specifications and settings (gauge pressure)

Fuel distributor 0 438 100 081	Checking value	4.5...5.2 bar (4.6...5.3 kgf/cm²)
(78/79 model)	Setting value	4.7...4.9 bar (4.8...5.0 kgf/cm²)
Fuel distributor 0 438 100 092	Checking value	4.7...5.4 bar (4.8...5.5 kgf/cm²)
(As of 80 model)	Setting value	4.9...5.1 bar (5.0...5.2 kgf/cm²)



- Pressure-reduction valve leaking (in 1979/80 model).
  Testing:
  Unscrew the fuel return line from the pressure-reduction valve (arrow) and seal off tight.

Switch on the electric fuel pump by bridging the safety circuit.
The pressure-reduction valve must not leak, i.e. no fuel must escape from the outlet.
Switch the electric fuel pump off again.
Replace the pressure-reduction valve if leaking.

- Fuel-line-pressure damper leaking (as of 1981 model).

A leaking fuel-line-pressure damper can be detected by removing the hose from the leak connection.

17. Testing the injection valves.

Remove the injection valves for testing.
When loosening the fuel lines, apply counter-force at the fixed hexagon of the injection valves.

When refitting the injection valves, it is best to replace the O-rings on the valve stem (Renault service part) in order to prevent leaks and thus the entry of unmetered air.

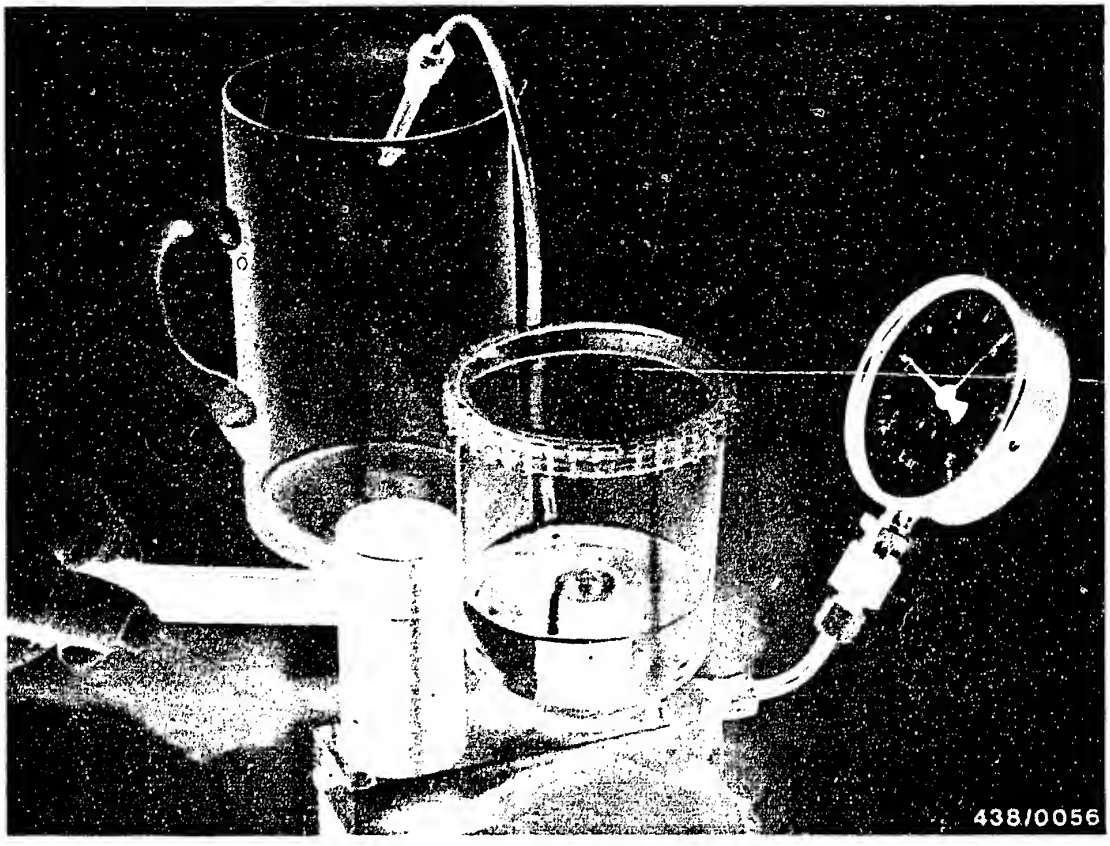
17.1 Test equipment and test media

The following testing specification refers to valve testers KDJE-P400 (previously KDEP 7452) and 0 681 200 700.

Observe the test-media specification!

Test media: Calibrating fluid (Shell K 30, Esso-Varsol, Shell Mineral Spirits 135)
or
Bosch Part No. VS 14 942-CH
Former Part No. 5 973 340 650
The calibrating fluid can be obtained in 5 l metal cans from the following supplier:
Firma
Oskar Gnamm GmbH & Co
D-7531 Kämpfelbach-Bilfingen

Caution:
For safety reasons, never use normal gasoline or similar easily inflammable and combustible liquids. Even with calibrating fluid, be sure to observe the local official regulations.

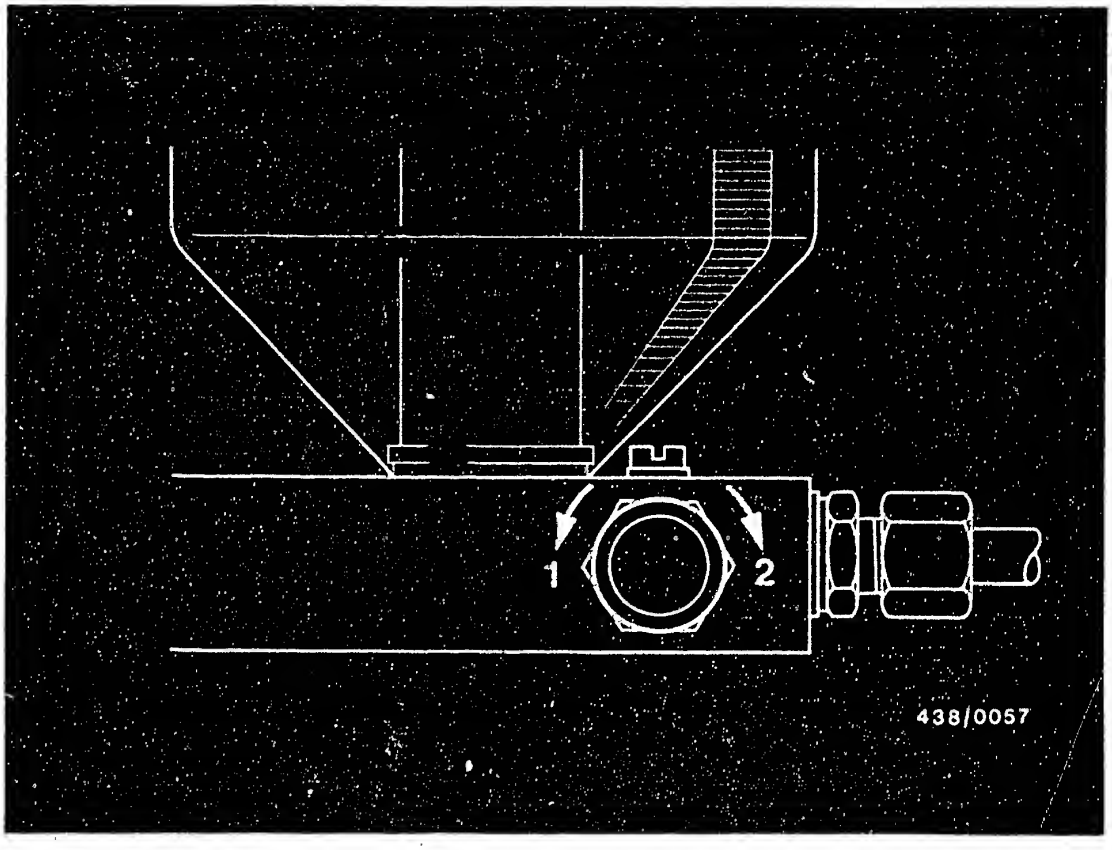


17.2 Connecting the injection valve to the tester

Connect injection valve to valve tester and bleed the discharge tubing by moving the lever back and forth several times with the union nut open. Then tighten the union nut. For injection valve 0 437 502 013 use double nipple 2 433 356 045.

17.3 Checking for dirt

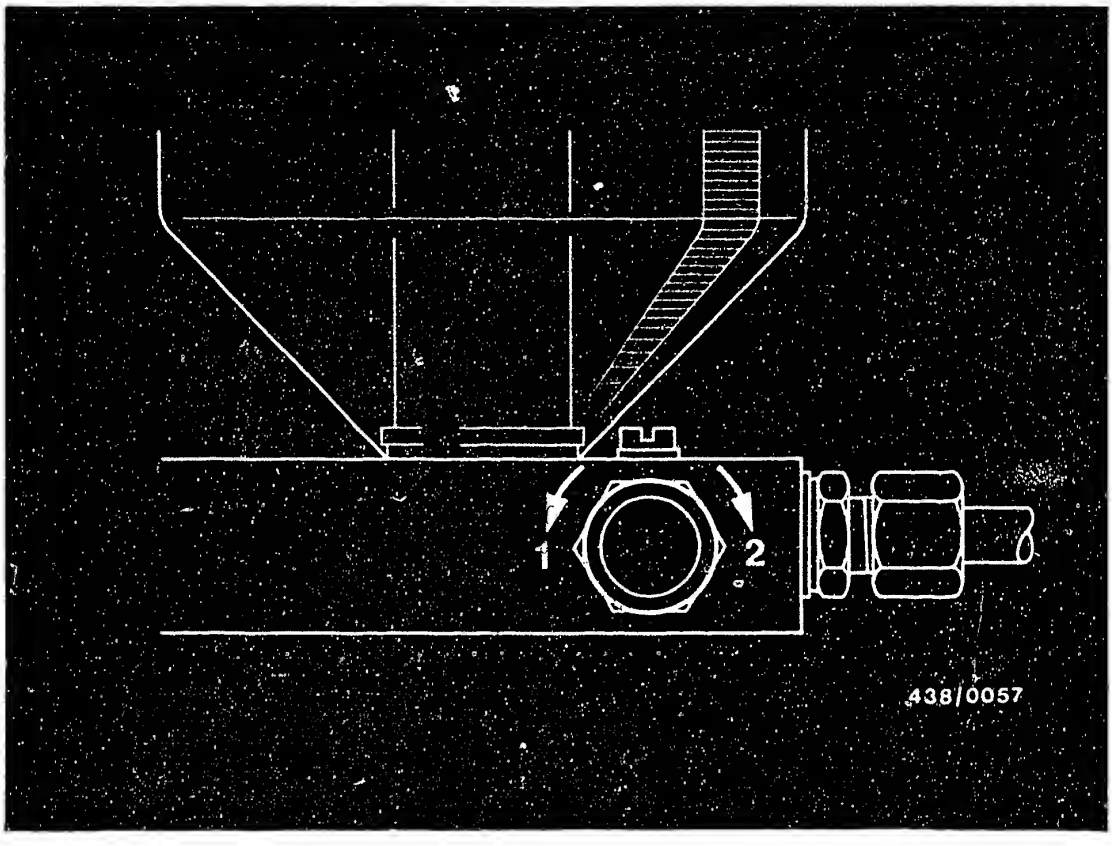
Move the hand lever slowly (about 2 seconds per stroke) back and forth with the stopcock on the pressure gauge open. If the pressure does not build up to 1...1.5 bar gauge pressure, the injection valve has a bad leak (caused, for example, by dirt stuck in it).
You can try to flush the injection valve clear by moving the lever back and forth several times strongly.
If this attempt is successful, continue the test. If it is not possible to flush the valve clear, replace it.



1 = Open 2 = Close

17.4 Testing the opening pressure

Injection valve Part No.	Test specifications - opening pressure (gauge pressure)
0 437 502 013	2.7...3.8 bar (2.8...3.9 kgf/cm^2)
0 437 502 010	3.0...4.1 bar (3.1...4.2 kgf/cm^2)



With the stopcock closed, flush the valve out and bleed it with several rapid movements of the lever.
Open the stopcock and test the opening pressure by moving the lever slowly (about 2 seconds per stroke).

If the opening pressure is outside tolerance, replace the injection valve. Individual valves can also be interchanged within a set.

17.5 Leakage test

Open the stopcock, build the pressure up slowly to a value 0.5 bar under the opening pressure determined previously (but not less than 2.8 bar gauge pressure), and hold it constant at that level. No drops must now fall from the valve for the next 15 seconds.

438/0058

17.6 Chatter test, evaluation of spray

Move the lever back and forth at about 1 stroke per second. As this is done, the valve must chatter. No drops of fuel must form at the mouth of the valve. The valve must not produce a "cord spray". Formation of a single-sided, atomized spray within an overall spray angle of about 35° is permissible (see example given in illustrations).

Illustration shows good spray formation.

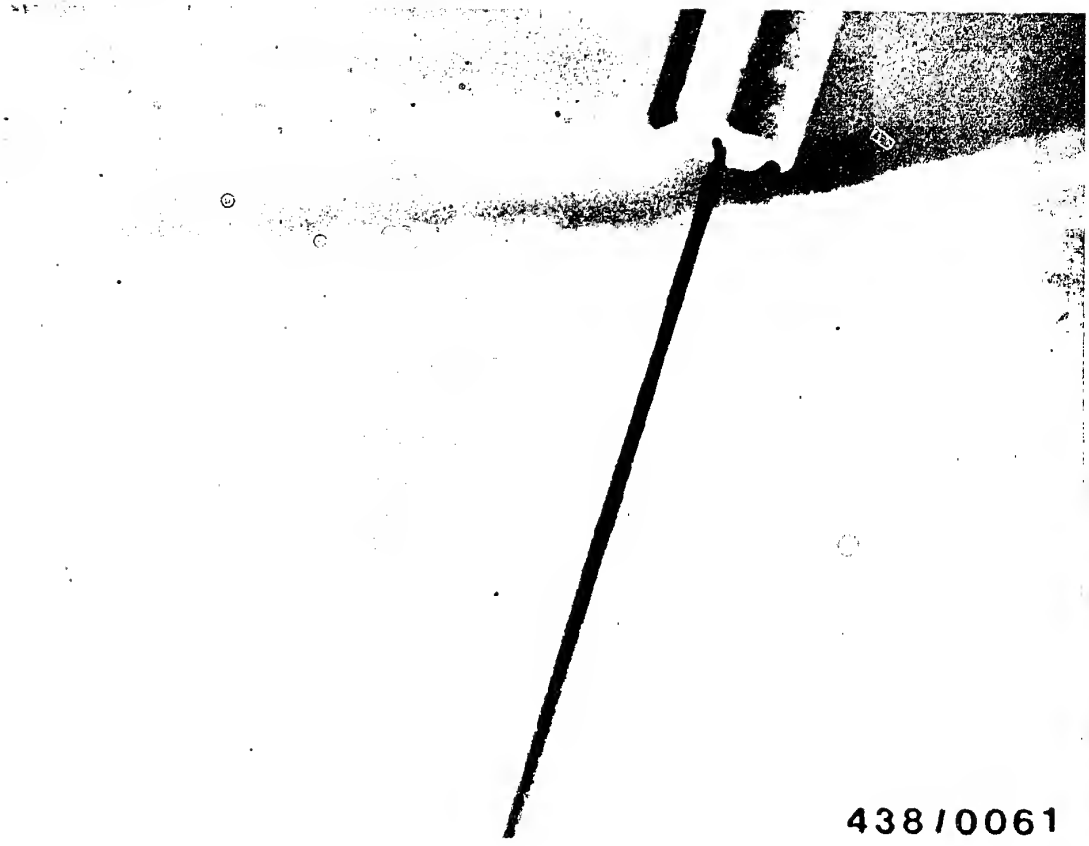
438/0059

Illustration shows single-sided but nevertheless good spray formation.

438/0060

Poor spray formation; replace injection valves.

Illustration shows drop formation.



438/0061

Poor spray formation; replace injection valves.

Illustration shows "cord" spray.

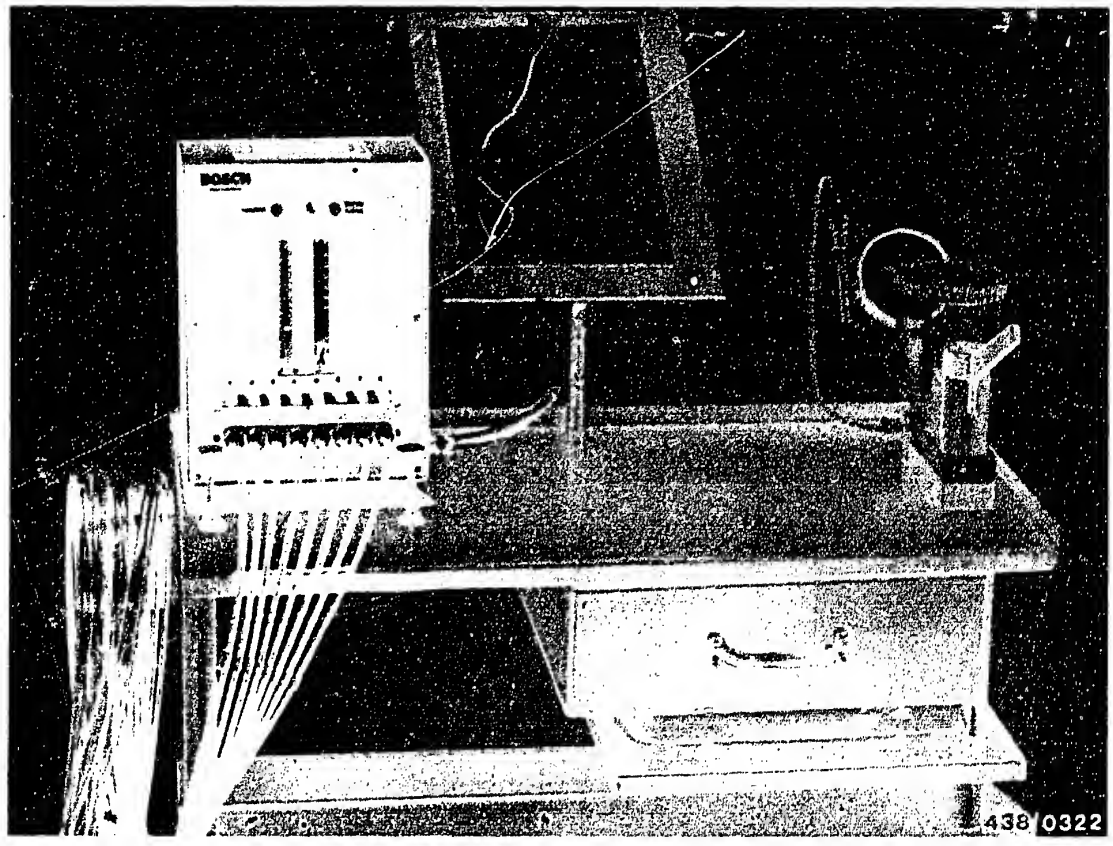
438/0062

Poor spray formation; replace injection valves.

Illustration shows "spray in strands".

If defective injection valves have been replaced, it is necessary finally to adjust the idle speed with the engine at normal operating temperature.

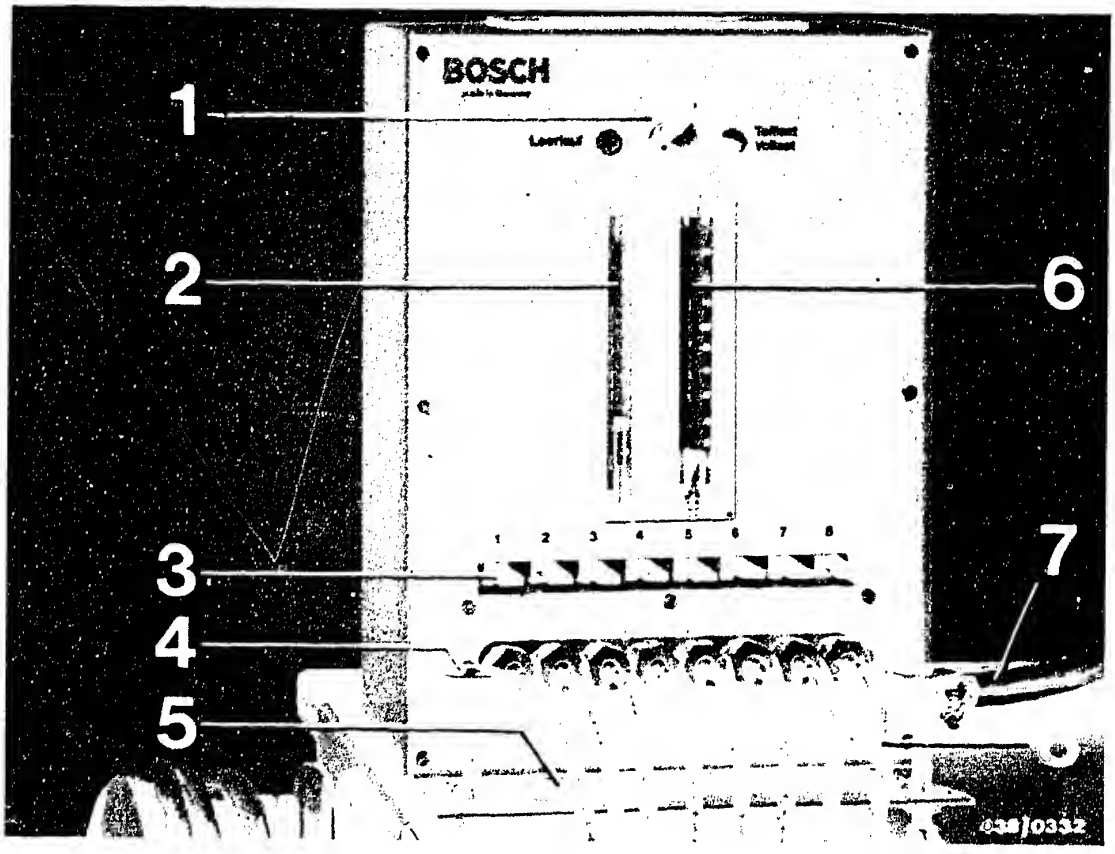
Idle-speed adjustment is described on Coordinates F 5.



18. Comparative measurement of fuel delivery of fuel distributor outlets.
This test is carried out using the tester for delivered quantity comparison KDJE-P 200 (previously KDJE 7451).

18.1 Application

By means of comparative measurements, the differences in the amounts of fuel delivered from the individual outlets on the fuel distributor are determined.
The tester is designed so that the test can be made on the vehicle without having to remove the fuel distributor.
Since the test is made with the original injection valves, the operator can recognize at the same time whether delivered-quantity scatter, if it occurs, is caused by the fuel distributor or by the injection valves.



1 = 3-way cock
2 = Small rotameter tube
3 = Keyboard for 8-way valve
4 = Adjusting screw for setting up
5 = Spirit level
6 = Large rotameter tube
7 = Return hose
8 = Polyamide hose lines (test lines)

18.2 Construction

The tester is designed for use with all engines, up to 8 cylinders, equipped with K-Jetronic.

Basically, the tester consists of a steel housing containing 2 rotameter tubes with measuring ranges of 2...15 cm^3 and 10...180 cm^3, an 8-way valve for key operation (Item 3) and a 3-way stopcock (Item 1).

The small rotameter tube (Item 2) is used for the idle measurement while the large tube (Item 6) is used to measure the fuel delivery at part- and full-load.

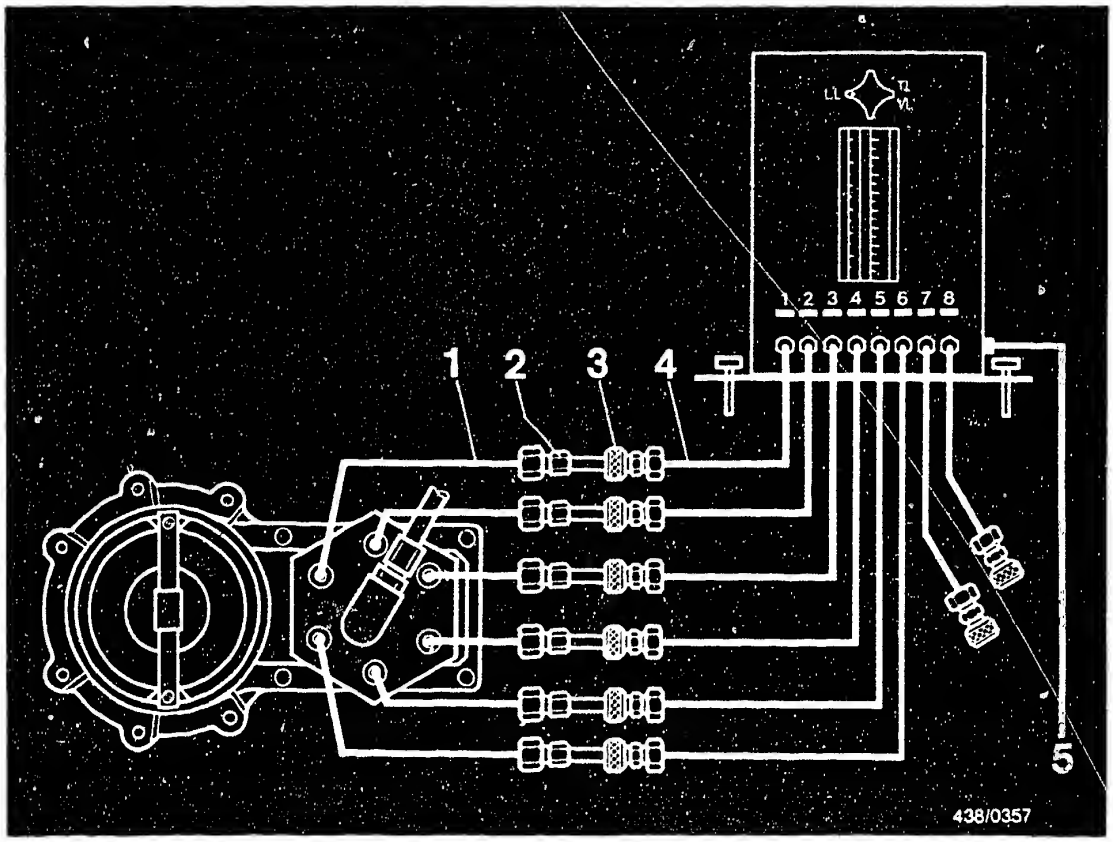
The particular rotameter tube to be used is connected by means of the 3-way stopcock.

Using the 8-way valve, the fuel delivery of each cylinder is tested one after the other.

Attached to the tester are 8 hoses (Item 8), each terminated with an automatic connector. When the injection valves are withdrawn from their sockets on the engine they are attached to these connectors. Each automatic connector is fitted with a push valve so that no fuel can escape from connectors that are not in use (when 4- or 6-cylinder systems are tested).

The fuel is returned to the fuel tank through a hose (Item 7) about 5 m long.

The entire test is made with a closed circuit, i.e. no fuel escapes.

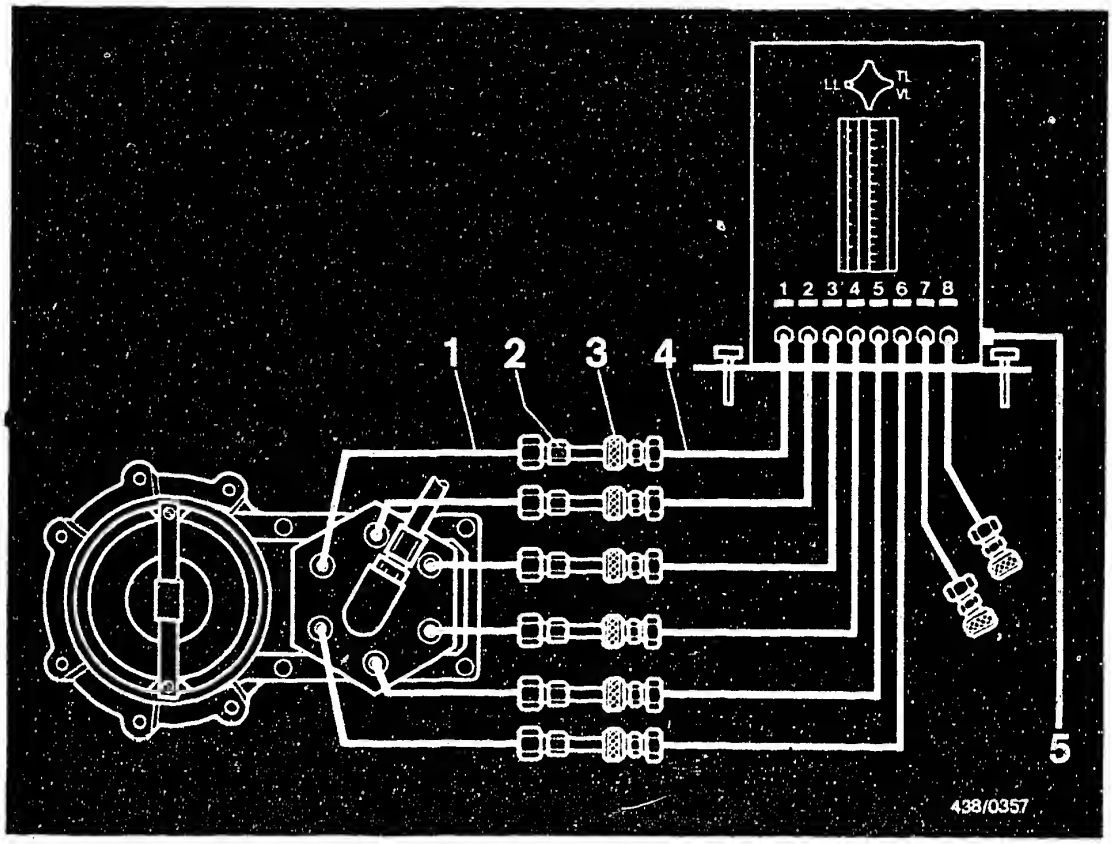


1 = Fuel distributor injection tubing
2 = Injection valves
3 = Automatic connectors
4 = Tester hoses
5 = Return line to fuel tank filler neck

• Connection for 1979/1980 models.

18.3 Setting up and connecting the tester:

Set the tester up beside the engine on a solid base (e.g. on tester trolley KDJE-W 100) and align it with the built-in spirit level at the base of the tester.



1 = Adapter connection hoses from line set KDJE-P 200/25.
2 = Injection valves
3 = Automatic connectors
4 = Tester hoses
5 = Return line to fuel tank filler neck.

● Connection as of 1981 model (with steel fuel-injection tubing)

- Remove the injection valves; the fuel-injection lines remain connected on the 1979/1980 models.

- As of the 1981 model

To prevent the rigid fuel-injection lines from being excessively bent, the tester for delivered quantity comparison is connected using the adapter connection hoses KDJE-P 200/25.
Remove the injection valves completely.

Unscrew the fuel-injection lines from the fuel distributor and connect the adapter connection hoses instead.

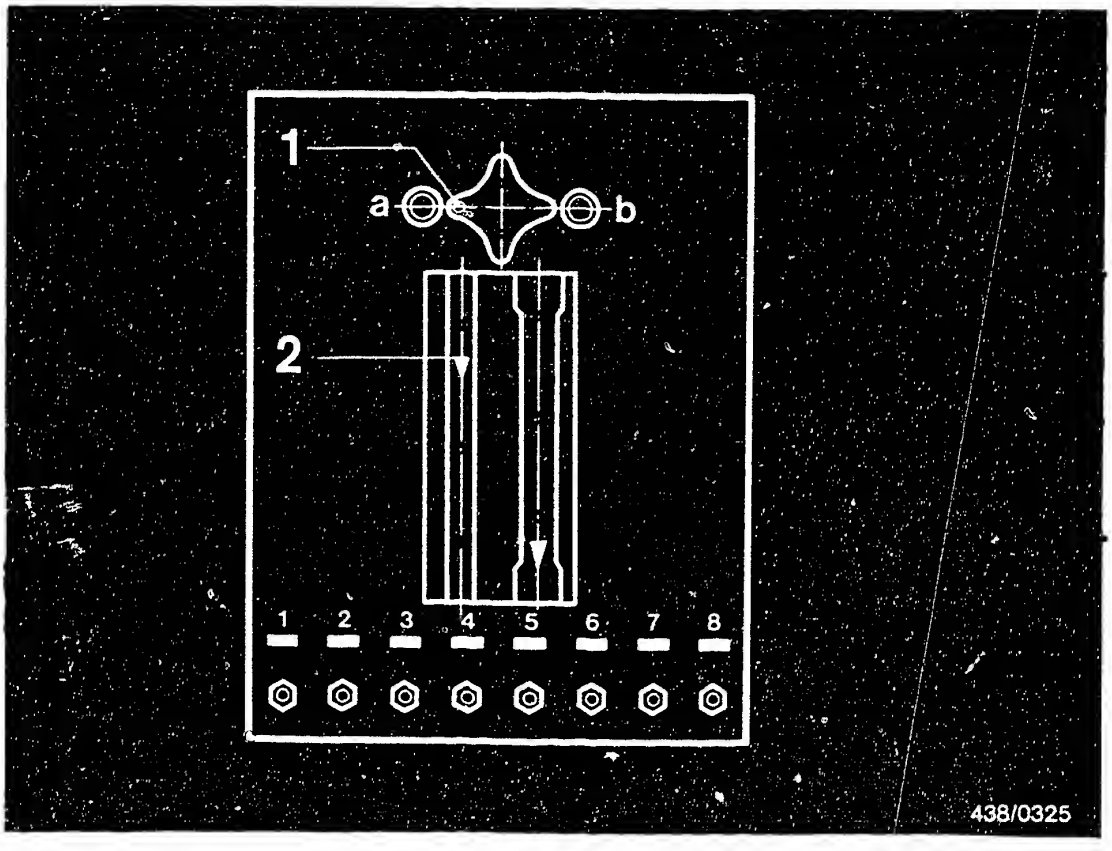
Screw the injection valves onto the adapter connection hoses. Clean the injection valves with a rag and insert in the appropriate order into the automatic connectors of the first six tester hoses.

Note:
Insert the injection valves firmly as far as they will go and tighten the knurled nuts securely so that the non-return valves of the automatic connectors are fully open.
Introduce the return hose of the tester into the fuel tank filler neck.

Before re-installing, check the cup seals on the valve stem for deformation and damage. If necessary, use new cup seals (Renault service part) in order to prevent leaks and thus the entry of unmetered air.

18.4 Bleeding the tester

Remove the air filter so that the air-flow sensor plate becomes accessible. Remove the electric plugs from the warm-up regulator and auxiliary-air device.
Switch on the electric fuel pump by bridging the electrical safety circuit.
Press down the air-flow sensor plate as far as it will go. Press the keys on the 8-way valve one after another, while simultaneously switching the 3-way stopcock until both rotameter tubes are bled.
Return the sensor plate to the rest position.

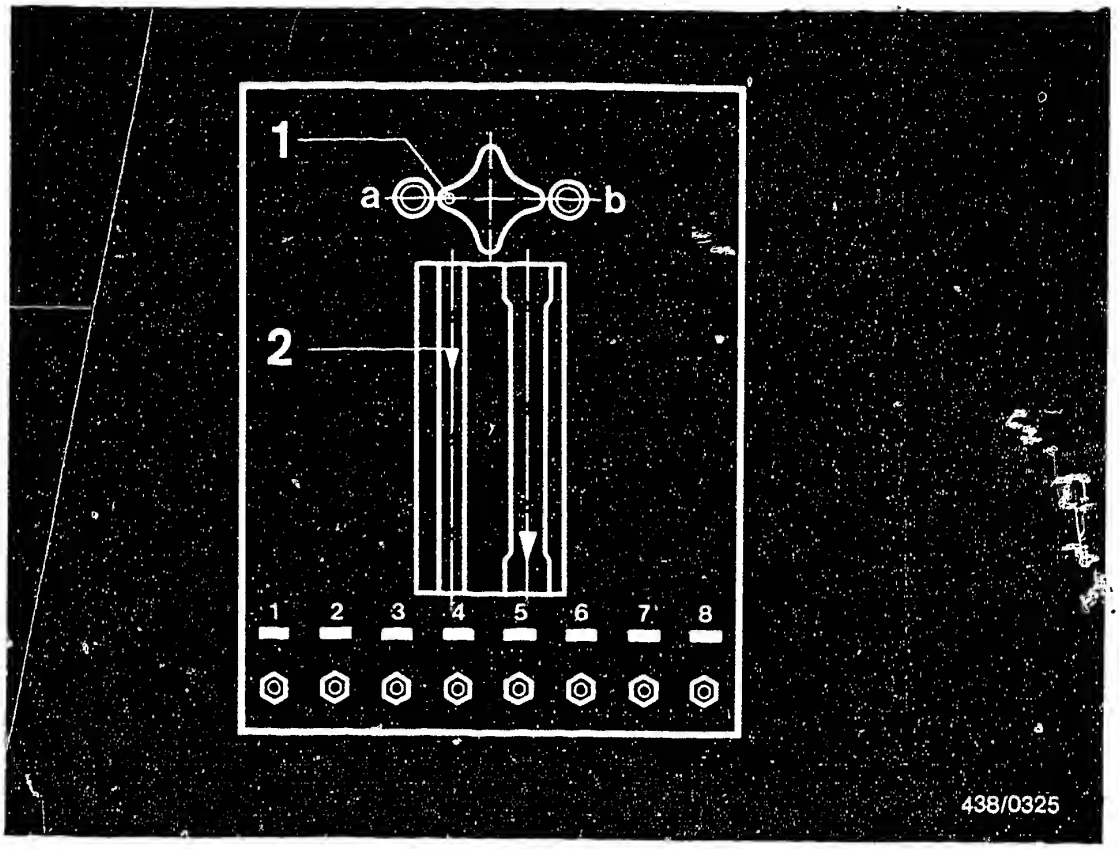


1 = White dot
2 = Measuring line

a = Idle
b = Part load/full load

18.5 Testing

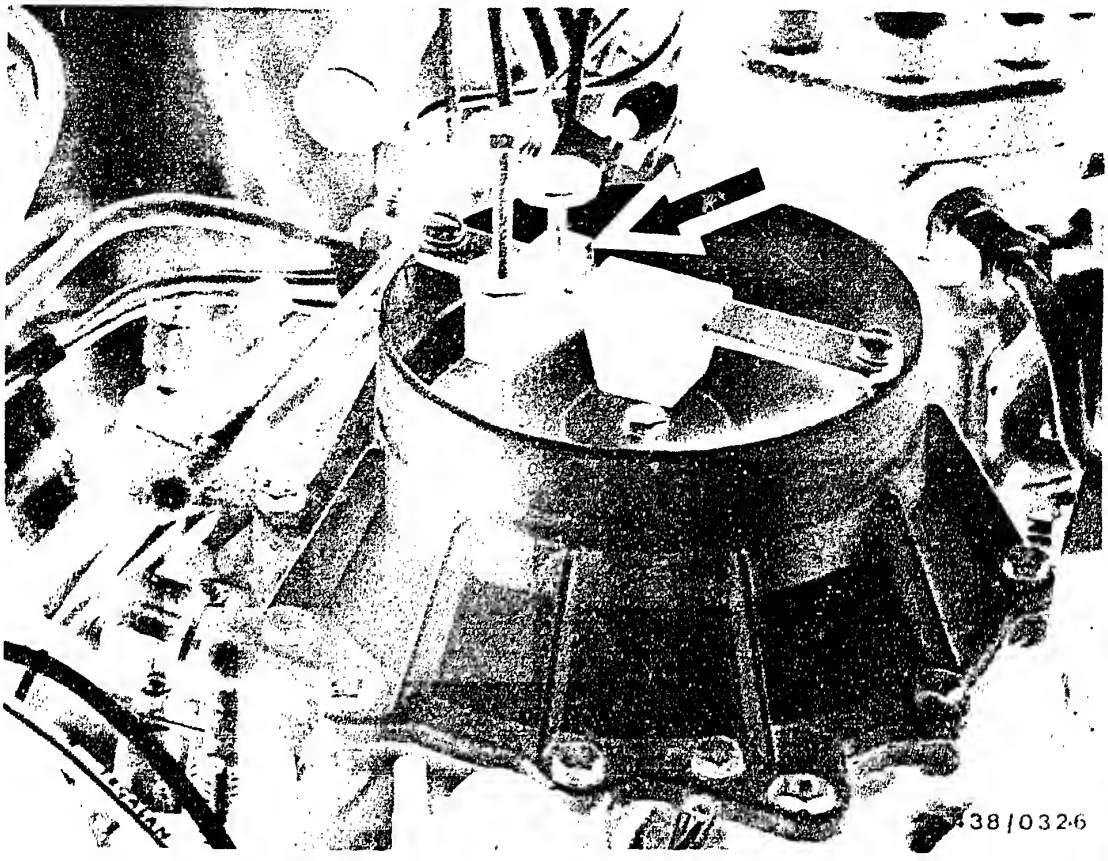
The flow comparison measurement is made in the idle, part-load and full-load ranges.
The small rotameter tube is to be used for the idle measurement (white dot to the left on control knob); part-load and full-load measurements are made using the large rotameter tube (white dot to the right).



1 = White dot
2 = Measuring line

a = Idle
b = Part load/full load

The delivered quantities indicated on the rotameter tubes are read off at the top edge of the conical float (Item 2). On testers with a ball float the uppermost point of the ball is used for reading off. With each measurement be sure to wait until the float has reached its final position. This may take 20 ... 30 seconds in the case of small deliveries.



The exact setting and locating of the position of the air-flow sensor plate for the various load ranges is done using the setting device KDJE 7456.

With the adjusting screw initially screwed all the way out, the setting device is clamped onto the stop bracket of the air funnel (arrow).

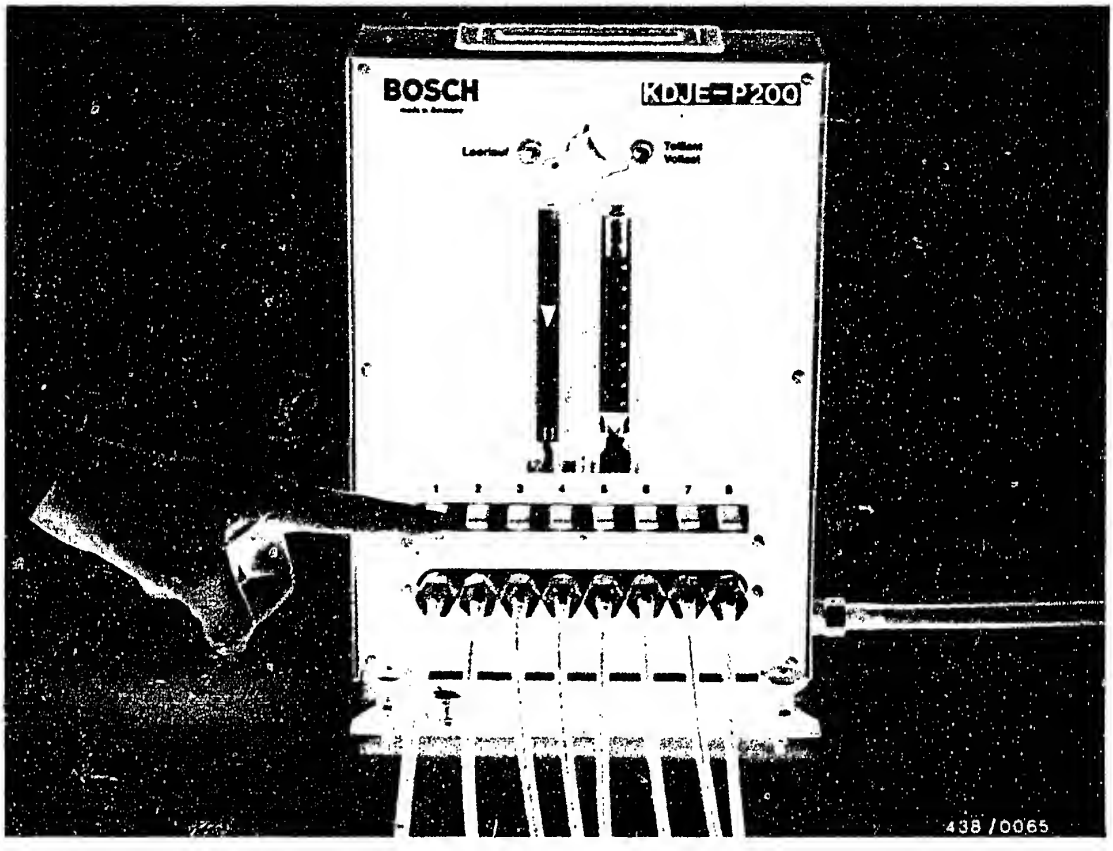
Adjust the position of the air-flow sensor plate using the adjusting screw.

Procedure:

Switch on the electric fuel pump by bridging the electrical safety circuit.

Fixed numerical values are specified in the following test section for the maximum permissible fuel delivery differences for the individual load ranges.

The "setpoint" value always pertains to the fuel-distributor outlet with the lowest fuel delivery, i.e. in each case the outlet with the lowest delivery is to be first ascertained.



Press the key for outlet 1. Pivot the air-flow sensor plate until the corresponding rotameter tube approximately indicates the "set point" value. Fix the air-flow sensor plate in this position.

Test the remaining outlets in order to determine which outlet has the lowest fuel delivery.

Press the key for this outlet again, and set the delivery precisely to the "set point" by correcting the position of the air-flow sensor plate. Then fix the air-flow sensor plate in this position again.

Press the remaining keys one after the other, and determine the maximum fuel delivery of each outlet. A deviation in fuel delivery can only be above the "set point".

18.6 Test specifications

Fuel distributor No. 0 438 100 081	Set point (cm^3/min)	Max. permissible fuel delivery (cm^3/min)
Idle	6.0	6.8
Part load	40.0	43.0
Full load	145.0	160.0

Fuel distributor No. 0 438 100 092	Set point (cm^3/min)	Max. permissible fuel delivery (cm^3/min)
Idle	6.0	6.7
Part load	40.0	43.0
Full load	155.0	170.0

If, in testing, too large a difference is ascertained in one of the three load ranges, the test should for safety's sake be repeated.

If the result is confirmed, you should check whether the fault lies in the fuel distributor or in the injection valves.

To do this interchange the injection valves with the greatest and smallest difference.
If the result is still the same, the fault is in the fuel distributor. If the fault follows the interchanged injection valves, it lies in the injection valves.
Change defective fuel distributor and/or replace defective injection valves.

18.7 Final operations

Check the seal rings on the stem of the injection valves for damage and deformation. If necessary, use new seal rings (Renault service part).

Also check the insulating sleeves. If necessary, tighten with hexagon-socket-screw key (AF 12 mm).

Re-install the injection valves. Make sure this is done correctly. Also install the rubber dome. Make sure that all lines are laid correctly.
Re-connect the electrical safety circuit of the K-Jetronic (re-insert relay). Make sure this is done correctly. By means of a trial run check whether all line connections are leak-tight.

Finally, check the idle adjustment. Correct if necessary (Coordinates F5).

19. Idle adjustment

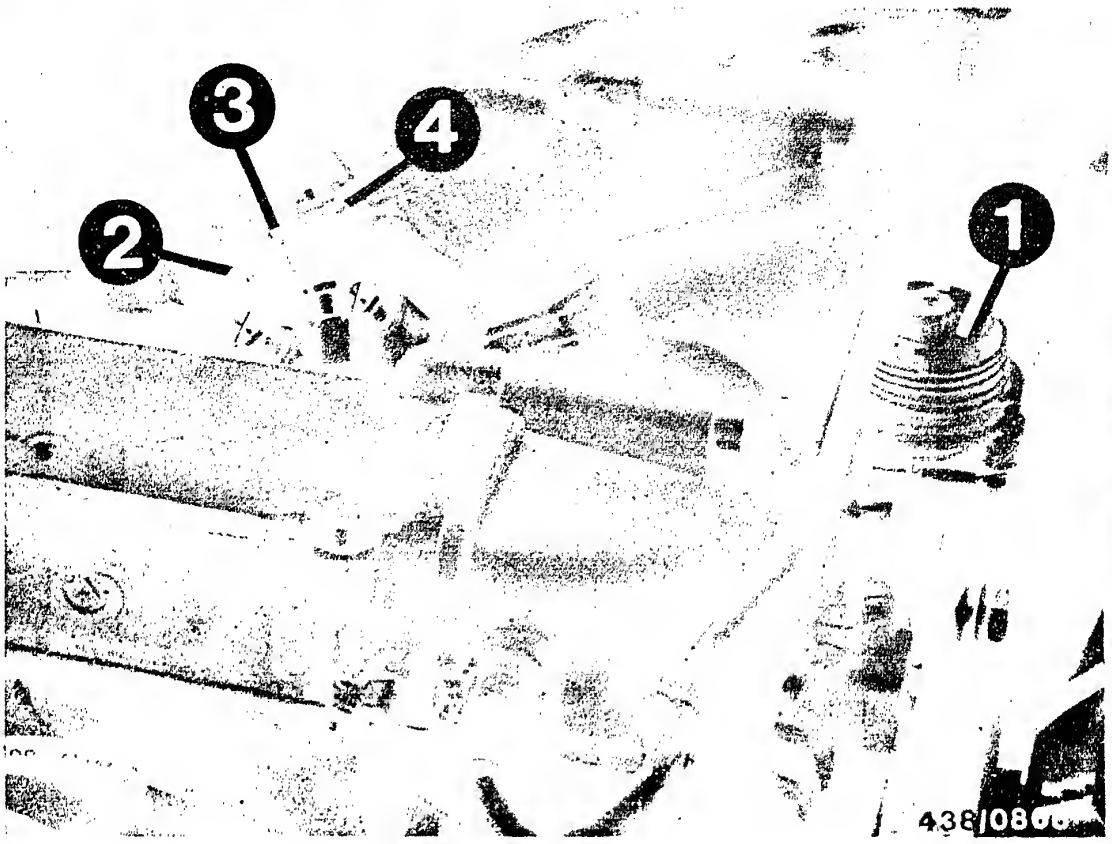
19.1 Test conditions:

Warm up the engine for the idle adjustment.

Important:

- If fuel-injection lines or injection valves have been loosened or removed, warm up the engine under load. The low fuel throughput at idle is not always sufficient to bleed the fuel-injection lines.
- The idle adjustment must not be carried out when the engine is too hot, e.g. immediately after the engine has been raced or after a power measurement on the rollertype test stand.
- In vehicles with an air conditioner, switch the air conditioner off when performing the idle adjustment in order to stabilize the engine speed.

Measure the engine speed with a separate tachometer.



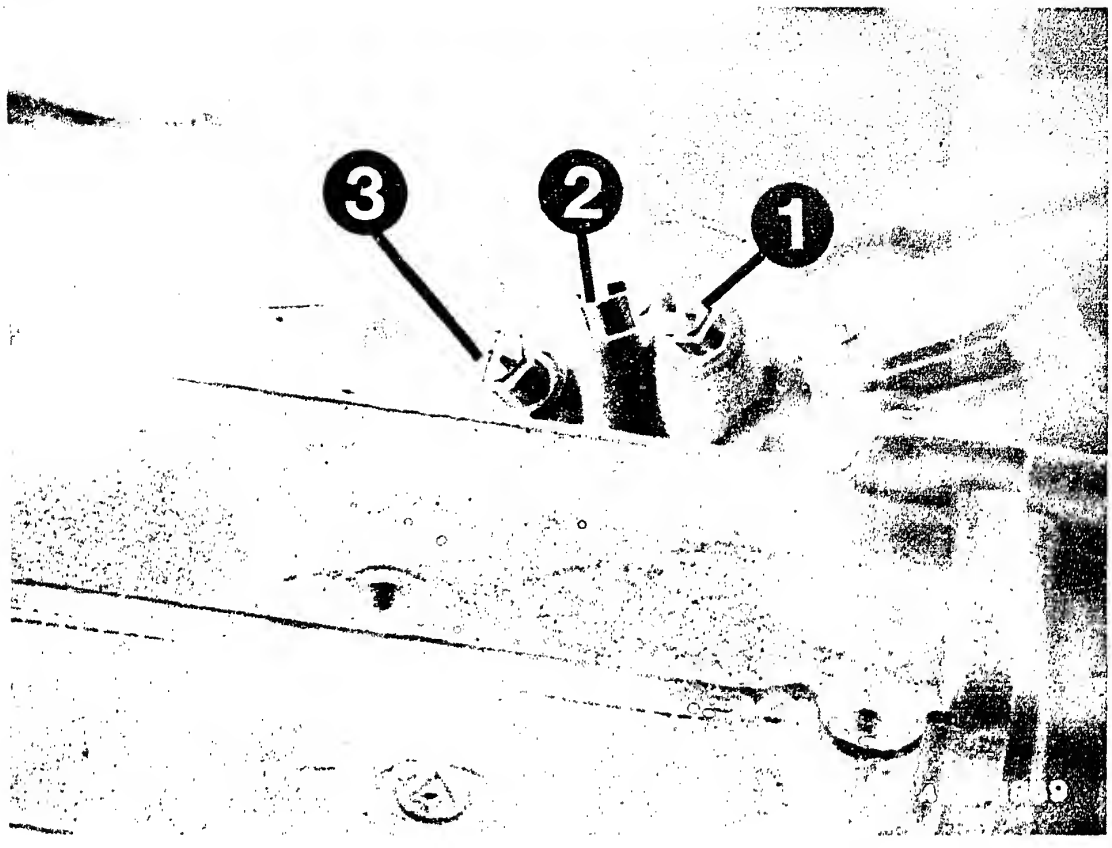
19.2 Checking/adjusting the basic setting of the throttle-valve lever

Unhook the connecting rod between roller (1) and lever (2).

Loosen lock nut (3).

Back off the adjusting screw (4) and then screw it in until it makes contact with the stop. Then turn it further by precisely one revolution and lock.

Adjust the length of the connecting rod so that it can be hooked in free of tension.
Adjust the throttle cable with respect to the roller so that the wire cable is taut, but so that the throttle-valve lever does not lift off from the stop.



19.3 Adjusting the idle speed

In the throttle housing there are 3 idle-speed adjusting screws.

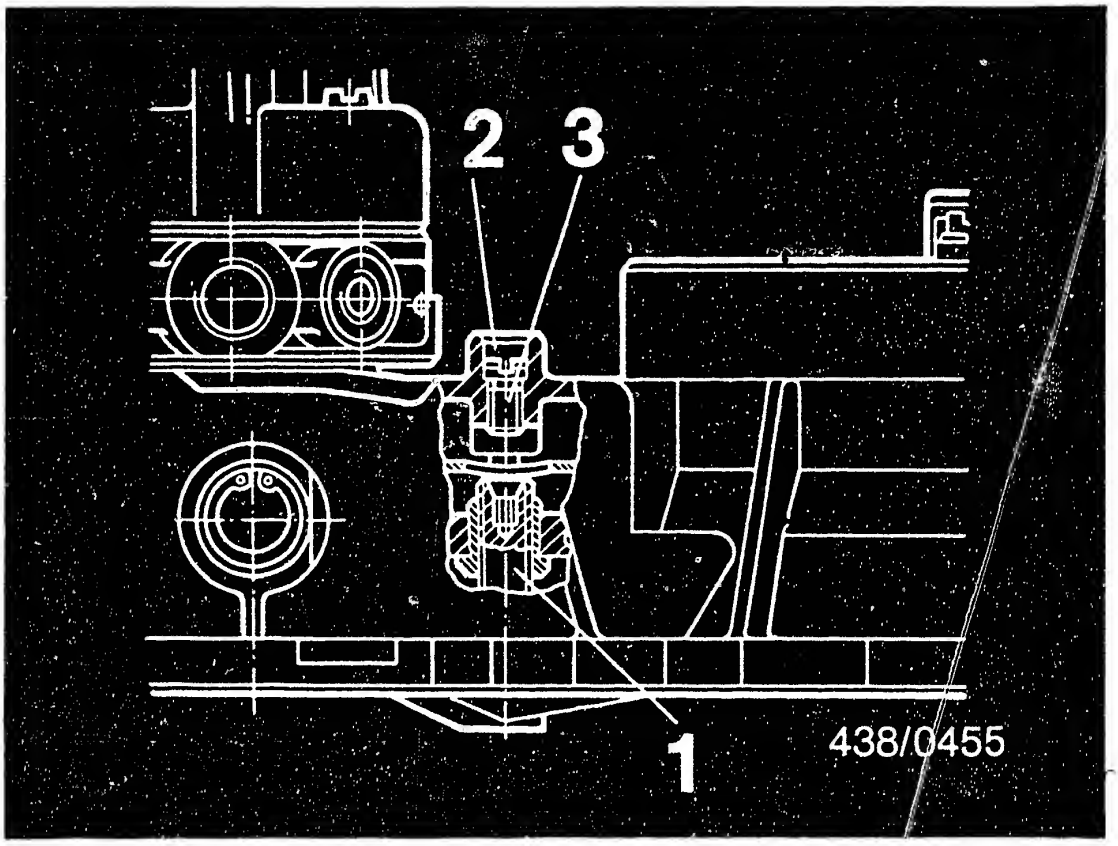
Screw 1 is for the right-hand cylinder bank.
Screw 2 is for the left-hand cylinder bank.
Screw 3 is for the overall adjustment.

Note: The right-hand intake manifold leads to the left-hand cylinder bank and vice versa.

Basic setting of the adjusting screws:

Screw in screws 1 and 2 as far as they will go. Then back off by 4 revolutions. Connect the exhaust-gas sampling hoses and warm up the engine.

The idle speed is set at screw 3.



19.4 Adjusting the CO concentration

Adjust the CO concentration by turning the idle-mixture-adjusting screw (1) in the mixture-control unit using the setting wrench KDEP 1035.

The idle-mixture-adjusting screw is accessible after removing ghe safety plug (2) and the screw plug (3) in the air-flow sensor housing.

The setting wrench KDEP 1035 is inserted through the housing bore into the idle-mixture-adjusting screw.

Turing to the right = richer mixture
Turning to the left = leaner mixture

Caution:

Always make the adjustment from the lean side, i.e. if the mixture is too rich turn the idle-mixture-adjusting screw further to the left than is necessary, and then turn it to the right up to the setting required.

After every adjustment remove the adjusting wrench and accelerate the engine briefly so that the intake passages cool down. Then wait until the reading on the CO analyzer has settled. Never accelerate the engine with the adjusting wrench still in place because this could result in bending the control lever in the air-flow sensor.

Note:
The screw plug for the idle-mixture-adjusting screw must be screwed in again after each adjustment since, with the downdraft air-flow sensor, unmetered air is drawn in through this bore, thereby making the measurement results incorrect.

19.5 Anti-tamper device for idle-mixture screw:

In the Federal Republic of Germany, in accordance with an order for amending the Road Traffic Registration Code, § 47, Exhaust Gases and Their Discharge, has been amended. This order was printed in full in the Verkehrsblatt 13 of 15 July 1975.

Accordingly, all motor vehicles with externally suppliec ignition produced as of 1 October 1976 must be provided with anti-tamper devices for the idle-mixture-adjusting screw so that it is not possible to adjust the screw without destroying the anti-tamper device. The intention is to prevent non-experts from re-adjusting the idle setting and thus inadmissibly influencing the exhaust gas. Consequently, the anti-tamper caps may only be used in the workshop and must not be sold to customers for their own use.

These anti-tamper caps come in different colours. Use the following cap and colour for the after-sales service:
In the downdraft air-flow sensor:
Blue anti-tamper cap (not obtainable from Bosch).
Part No. of Daimler Benz 000.997. 5986
Of Deutsche Vergaser Gesellschaft: K 34 520

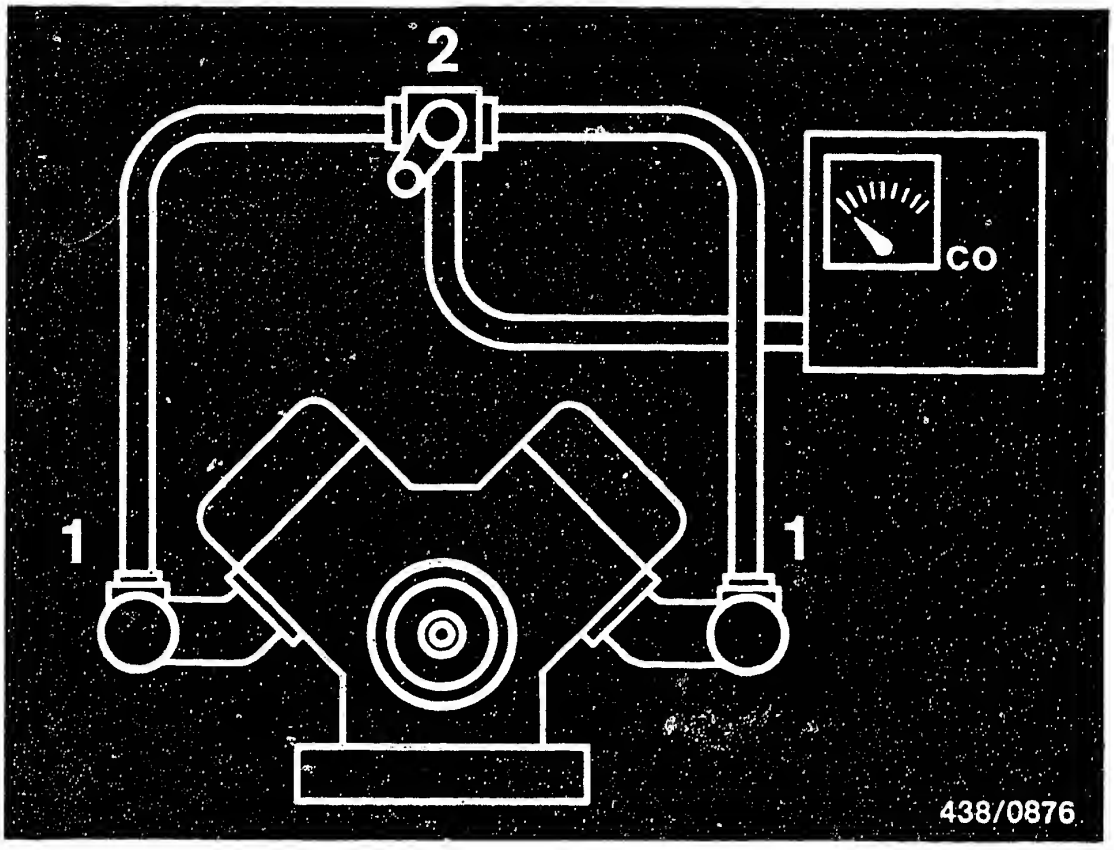
The housing bore (for receiving the adjusting wrench) is sealed by a plug.
The anti-tamper device is removed and fitted using special tools (e.g. tool set No. 4521/7 from Hazet Co.. 5630 Remscheid).

19.6 Sampling and measuring the exhaust gas

The exhaust gas sample for the CO measurement is taken separately for both banks of cylinders.

There are fittings at the end of the exhaust manifolds which are sealed off with a screw.

The picture shows the right-hand connection point (arrow).



The diagram shows an example of an exhaust-gas sampling set for user fabrication.

The two hose lines (1) must be resistant to the temperature of the exhaust gas and are brought together at a commercially available three-way change-over cock (2). Minimum bore diameter of the three-way cock 4 mm.

Set the three-way cock for exhaust-gas sampling to the centre position. The exhaust gas of both banks of cylinders is now sampled.

The CO concentration must comply with the specification.

If necessary, make the adjustment with the idle-mixture-adjusting screw in the mixture-control unit.

If necessary, after correcting the CO setting, re-adjust the idle speed at adjusting screw 3.

Then test the CO concentration of the two cylinder banks individually by throwing over the three-way cock. Make corrections at adjusting screw 1 or 2 until both cylinder banks are set to the correct (and equal) value at the correct idle speed.

All adjustments (speed, CO concentration of the two cylinder banks, total CO) may possibly have to be repeated several times until all values are within the specified range.

19.7 Idle test specifications and settings

- Conditions
  Engine at normal operating temperature
  Air conditioner switched off

- Idle speed
  Manually-shifted transmission: 850... 950 min^{-1}
  Automatic transmission: 925...1025 min^{-1}

- CO concentration
  for each cylinder bank

  Manually-shifted transmission: 1.5...2.5 % by vol. CO
  Automatic transmission: 1.0...1.5 % by vol. CO

After-sales Service

Technical Bulletin

Packaging of goods under warranty

438

K-Jetronic (CIS)

VDT-I-438/101 B
10. 1976

All components or assemblies of the K-Jetronic which are dispatched under warranty must be correctly and carefully packaged so that no further damage or impairments occur during transit, since these would not be covered by warranty.

Any fuel remnants must be removed from those K-Jetronic assemblies intended for dispatch, so as to eliminate any danger of fire during transit.

The intake openings and outlets of the assemblies must be sealed off with caps or plugs. As new products were fitted, the caps or plugs from these may be used.

The plunger of the fuel distributor is to be fitted with a protective cap of adequate size, or secured to the fuel distributor.

In addition, the assemblies are packed in tightly packed, well-sealed plastic sleeves. Fuel distributors and warm-up regulators are packed individually.

If components arrive damaged due to incorrect packaging or do not comply with these instructions, they can be returned and the warranty claim rejected.

BOSCH Geschäftsbereich KH Kundendienst. Kfz-Ausrüstung.

After-sales Service

Technical Bulletin

Securing of idle-speed adjusting screws

K-Jetronic (CIS)

438

VDT-I-438/102 B
11.1976

According to a statutory regulation, changes have been made to § 47 of the German traffic licensing laws concerning exhaust gases and their outlets. This regulation was printed in full in traffic law sheet 13 of 15.7.75 .

Consequently, all motor vehicles with external-ignition engines must have their idle-speed adjusting devices secured from the 1st October 1976, so that adjustment of the screw is impossible without destroying the securing device. This should stop unskilled people from adjusting the installation of the idle-speed system and thereby illegally influencing the emission values. As from now, securing caps can only be used in the workshop and cannot be sold to customers for their own use.

Securing caps are produced in various colors. For after-sales service the following caps and colors are used:

downdraft air-flow sensor	
Blue	securing cap is not available from BOSCH. Part number is DB 000.997.59 86 from the Deutsche Vergaser Gesellschaft K 34 520
updraft air-flow sensor	
Red	Part number 3 430 522 002

These stipulations are only valid in countries where ECE regulations (Economic Commission for Europe) apply. The air-flow sensors must however be converted for the use of these securing caps, as a matter of principle. The caps can also be used in countries not subject to ECE regulations, to prevent dirt penetrating through the pipe to the adjustment in the case of updraft air-flow sensors.

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

After-sales Service

Technical Bulletin

EXCHANGEABLE NON-RETURN VALVES
in electric fuel pumps 0 580 254 ..

VDT-I-438/104 En
5.1982
(replaces Ed. 3.1982

Electric fuel pump	Parts set (non-return valve + seal ring)	Non-return valve	Seal ring
0 580 254 001	1 587 010 500	---	---
.. 002	.. 500	---	---
.. 950 }	1 587 010 006	---	---
.. 951 }		---	---
.. 952	1 587 010 002	---	---
.. 953	.. 501	---	---
.. 954	.. 002	---	---
.. 956	.. 002	---	---
.. 957	.. 002	---	---
.. 958	.. 002	---	---
.. 959	.. 002	---	---
.. 960	.. 002	---	---
.. 961	.. 002	---	---
.. 962	.. 002	---	---
.. 963	.. 005	---	---
.. 964	.. 002	---	---
.. 965	.. 002	---	---
.. 966	.. 002	---	---
.. 967	.. 002	---	---
.. 968	.. 002	---	---
.. 969	.. 002	---	---
.. 970	.. 002	---	---
.. 971	.. 002	---	---
.. 972	.. 002	---	---
.. 973	.. 002	---	---
.. 974	.. 002	---	---
.. 975	.. 003 [4]	---	---
.. 976	.. 004 [3]	---	---
.. 977	.. 004 [3]	---	---
.. 978	1 587 410 901	---	---
.. 979	010 004 [3]	---	---
.. 980	.. 002	---	---
.. 981	.. 002	---	---

[3] = Parts set ... 003 also possible (delivery line connection at 90°)
[4] = Parts set ... 004 also possible (delivery line connection axial)

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung

Electric fuel pump	Parts set (non-return valve + seal ring)	Non-return valve	Seal ring
.. 982 [1]	.. 003 [4]	---	---
.. 982 [2]	1 587 410 901	---	---
.. 984	010 004 [3]	---	---
0 580 254 985	---	1 583 385 006	1 580 203 002
.. 986	---	.. 386 011	.. 001
.. 987	---	 008	.. 001
.. 988	---	.. 008	.. 001
.. 989	---	.. 008	.. 001
.. 990	---	.. 385 004	.. 002
.. 991	---	.. 004	.. 002
.. 992	1 587 010 001	---	---
.. 996	---	.. 386 011	.. 001
.. 998	---	.. 385 004	.. 002

[1] = until FD 822

[2] = from FD 823

[3] = Parts set ... 003 also possible (delivery line connection at 90°)

[4] = Parts set ... 004 also possible (delivery line connection axial)

Please direct questions and comments concerning the contents to our authorized representative in your country.

After-sales Service

Technical Bulletin

HOT-STARTING PROBLEMS

438

VDT-I-438/105 En
3.1980
Replaces Ed. 2.1980

K-Jetronic

Hot-starting problems can occur in various vehicles fitted with K-Jetronic. This means that when an engine is switched off whilst still hot and then switched on again after a short period, it does not start as well as it should.

The engine, the ignition system and the K-Jetronic system in these vehicles should be carefully checked. With the K-Jetronic particular attention should be paid to the:

complete system (in case of leaks),
injection valves (in case of leaks),
correct position of the air-flow sensor plate (rest position).

Instructions can be found in the vehicle-related repair manuals VDT-W-438/5.. .

If the engine still does not start satisfactorily when hot, even after checking, a timing relay can be fitted in K-Jetronic systems which are not equipped with a solenoid valve for reducing the control pressure as additional starting help.

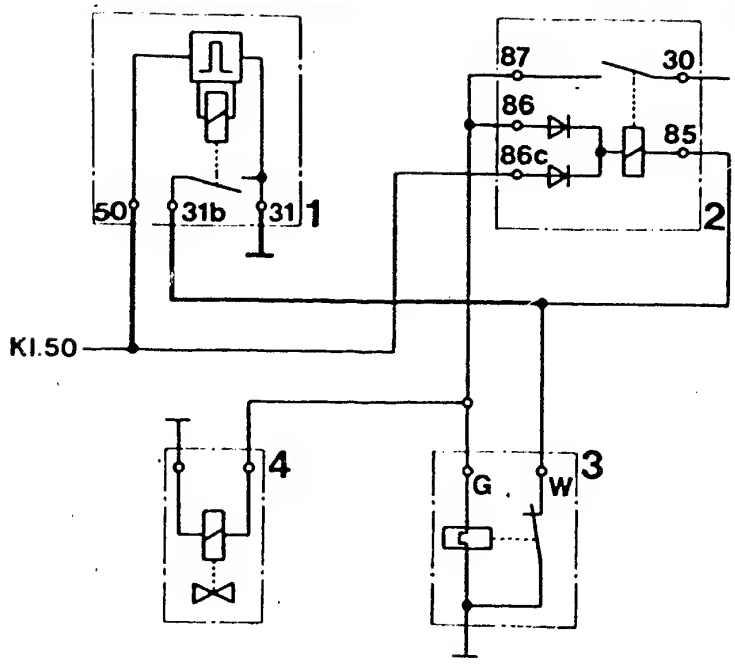
Timing relay 0 340 000 003 controls the start valve during hot starts. The start valve then injects extra fuel intermittently (sometimes cutting out completely.

The timing valve is fitted according to the wiring diagram (see reverse side). The fitting of this relay will be charged for.

After fitting the timing relay starting should be carried out as follows:

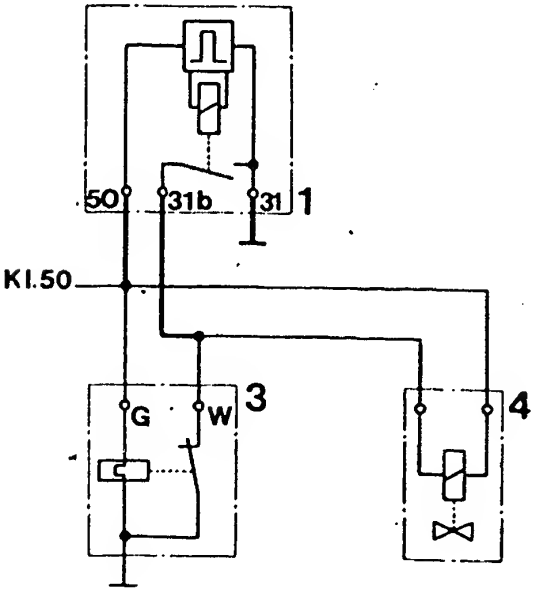
Vehicles with start valve in intake manifold - with open throttle valve,
Vehicles with start valve in idle duct - with closed throttle valve.

BOSCH Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung.



K-Jetronic system with post-injection relay

1 = Timing relay 0 340 000 003
2 = Post-injection relay
3 = Thermo-time switch
4 = Start valve



K-Jetronic system without post-injection relay

After-sales Service

Technical Bulletin

FIRMLY FITTED NON-RETURN VALVE

VDT-I-438/107 En

5.1980

Repairs
fuel pumps 0 580 254 ...

Previously fuel pumps with non-exchangeable non-return valve (see VDT-I-438/104 En) had to be exchanged completely in cases of leakage in the non-return valve.

If the fuel pump is in working order and only the non-return valve leaks, there is now the possibility of repairs as part of after-sales service. 2 parts sets have been produced for this purpose, they contain, amongst other things, a tube fitting with built-in non-return valve.

Before using the parts set the installation conditions should be checked. The defective non-return valve can remain in the fuel pump which does not have to be dismantled for fitting the parts set. Before disconnecting the fuel lines the pressure fittings of the fuel pump and the fuel lines should be thoroughly cleaned.

Description and fitting

Parts set 1 587 010 003 for fuel connection with inlet union.

Screw the tube fitting (short side) with the thick flat seal ring into the pressure fitting and tighten. In doing so press against the hexagon of the pressure fitting with a wrench. Place the thin flat seal ring, the fuel-line inlet union and the other flat seal ring on to the long side of the tube fitting and tighten with the hexagon cap nut. Run the engine and check that there are no leaks in the connection.

Parts set 1 587 010 004 for fuel connection with nipple and union nut.

Screw the tube fitting with flat seal ring into the pressure fitting and tighten. In doing so press against the hexagon of the pressure fitting with a wrench. Screw the fuel line to the tube fitting with a union nut and tighten. Run the engine and check that there are no leaks in the connection.

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung.

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